

DoD
FLIGHT INFORMATION PUBLICATION
(ENROUTE)



**FLIGHT
INFORMATION
HANDBOOK**



EFFECTIVE **22 JAN 2004**
NEXT EDITION 2 SEP 2004

Consult NOTAMS for latest information

TABLE OF CONTENTS

Special Notices	Inside Front Cover
General Information	1
Index of Subjects	2
Section A: Emergency Procedures	
Table of Contents	A-1
Section B: National and International Flight Data and Procedures	
Table of Contents	B-1
Section C: Meteorological Information	
Table of Contents	C-1
Section D: Conversion Tables	
Table of Contents	D-1
Section E: Standard Time Signals	
Table of Contents	E-1
Section F: FLIP and NOTAM Abbreviations/Code	
Table of Contents	F-1
Interception Signals ICAO Standard	Outside Back Cover

SECTION A

SECTION B

SECTION C

SECTION D

SECTION E

SECTION F

Published by
NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY
ST. LOUIS, MISSOURI

©Copyright 2004 by the United States Government
No copyright claimed under Title 17 U.S.C.



NSN 7641014109531
NGA REF. NO. ENRXXFLTIHBK



EFF. DATE 04022

SPECIAL NOTICES SECTION

A Special Notice section concerning NEW FLIP FEATURES appears below and contains notices of new requirements or major modifications of existing FLIPs. New notices appearing for the first time will be shown first. New feature notices will be carried for three issues and then dropped. In the event there are no NEW FLIP FEATURES, the word "NONE" will be centered within the NEW FLIP FEATURES box.

Special Notices of a **permanent** nature will be carried for three issues and then incorporated in the appropriate section of the applicable FLIP product. Notices of a **temporary** nature will be carried in this section for the life of the notice. **New or modified** notices are emphasized by an outline and the date of first issuance at the top of the notice. Outline will be eliminated from temporary notices after one issue and issuance date will be relocated at the end of the notice.

SPECIAL NOTICE

ATC PHRASEOLOGY changes: "TAXI INTO POSITION AND HOLD" is changed to "POSITION AND HOLD", See General Planning Chap 2 TERMS.

HOLDING POSITION (ICAO) - Runway-holding position. New phraseology, See General Planning Chap 2 TERMS.

LINE UP [AND WAIT] (ICAO) - Clearance to enter runway and await take-off clearance. New phraseology, See General Planning Chap 2 TERMS.

NEW FLIP FEATURES

NONE

GENERAL INFORMATION 1

GENERAL INFORMATION

1. GENERAL

a. The Flight Information Handbook is a DoD Flight Information Publication (FLIP) issued every thirty-two weeks by the National Geospatial-Intelligence Agency (NGA); 3200 South Second Street, St. Louis, MO 63118-3399. The Flight Information Handbook contains aeronautical information which is required by DoD aircrews in flight, but which is not subject to frequent change. This publication is intended for U.S. Military use, and procedures herein may not be applicable to other users.

b. The Flight Information Handbook may be amended to disseminate informational changes between FLIP publication cycles by NGA STL publication of a textual or graphic Urgent Change Notice (UCN) as required or by the regular NOTAMs issued via the FAA/DoD Integrated NOTAM System.

c. NEW OR CHANGED INFORMATION: To alert users of new information or changes to information from the previous issue, a vertical line will be portrayed to the left of and extending the full length of the new and/or revised data. This symbol will not apply to the front cover.

2. REVISIONS, QUALITY REPORTS, REQUISITIONS, DISTRIBUTION AND SCHEDULES - See FLIP General Planning, Chapter 11.

3. INTERNET - DAFIF, E-CHUM, Enroute Supplements and Planning Documents available at: <http://164.214.2.62/products/digitalaero/index.html>

4. CUSTOMER HELP - For questions concerning this or other NGA Products or Services please phone the NGA Operational Help Desk 1-800-455-0899, (314) 263-4864 or DSN 693-4864.

2 INDEX OF SUBJECTS

INDEX OF SUBJECTS

SECTION

Abbreviations F

Air/Ground Emergency Procedures. A

Aircraft Classification Numbers D

Aircraft Witnessing Distress A

Automated Weather Observing System (AWOS) C

Automatic Terminal Information Service (ATIS). C

BBC Radio Time Signals E

Canadian Time Signals E

CIRVIS Reports B

Conversion Tables D

Distress and Urgency Signals - ICAO. A

FAA Air Traffic Control Procedures B

FAA Enroute Flight Advisory Service (EFAS). C

FAA Fast File Flight Plan B

FAA Pilot-to-Weather Briefer Service C

FAA Weather Broadcasts C

FLIP and NOTAM Abbreviations F

Frequency Pairing Plan. D

Global HF System. B

Hijacked Aircraft. A

ICAO HF Aeronautical Station List. B

In-Flight Technical Assistance A

Interception Signals - ICAO Standard Outside Back Cover

Lighting Systems B

Meaconing-Intrusions-Jamming and Interference (MIJI) Procedures B

Meteorological Information and Services C

Mode 4, Register of National Clearances and Operational restrictions
on the Use of IFF Mark XII B

NATO Color Coded Weather Conditions C

Navy Time Signals E

Notice to Airman (NOTAM) Code F

Oceanic Area Common VHF Frequencies B

Pilot-to-Metro and Weather Radar Facilities C

Pilot Weather Reports (PIREPs) Format. C

Pollution Report (POLREP) Format B

Position Reporting Procedures B

Procedures for the Prevention of Dangerous Military Activities Between the US and Russia A

Recommended Procedures for Any Emergency Phase A

Recommended Procedures for Aircraft in Distress When Intercepted. A

Recommended Procedures for for the Interceptor after Interception A

Runway Condition Reading (RCR), U.S. Navy/U.S. Army. B

Search and Rescue Satellite (SARSAT). A

SIGMETS and AIRMETS C

Standard Time Signals E

Standard Time Zones of the World E

Telephone Weather/NOTAM Briefings C

Two-Way Radio Failure. A

USAF Bird Watch B

SECTION A**EMERGENCY PROCEDURES****TABLE OF CONTENTS**

	<u>PAGE NO.</u>
Aircraft Witnessing Distress	A-28
Air/Ground Emergency Procedures (Aircraft and Ground Signals)	A-29
Distress and Urgency Signals - ICAO	A-26
Hijacked Aircraft	A-25
In-Flight Technical Assistance	A-25
Interception Signals	A-32
Interference With International Search And Rescue Satellite (SARSAT)	A-5
Procedures for the Prevention of Dangerous Military Activities Between the US and Russia .	A-50
Recommended Procedures for Any Emergency Phase (Uncertainty, Alert, Distress, Lost) . . .	A-2
Recommended Procedures for the Interceptor After Interception	A-5
Two-Way Radio Failure	
Airport Traffic Control Light Signals	A-11
Country/Theater Exceptions to Standard Procedures	A-12
FAA Procedures	A-6
ICAO Procedures	A-8
Visual Signals When Radio Inoperative	A-9

A-2 EMERGENCY PROCEDURES

1. RECOMMENDED PROCEDURES FOR ANY EMERGENCY PHASE (UNCERTAINTY, ALERT, DISTRESS, URGENCY, LOST)

(ICAO ANNEX 10)

a. Activate IFF to EMERGENCY; if equipped with SIF, set the master control switch to EMERGENCY and proceed with the appropriate step listed below:

(1) If under positive radar control (or in an environment that requires a specific squawk) maintain codes as previously set.

(2) In situations other than (1) above: Switch to Mode 3/A, code 7700.

b. Transmit the following message to any agency on the air-ground frequency in use at the time. If unable to establish communication attempt contact on any of the following emergency frequencies:

UHF/VOICE	VHF/VOICE	MF/VOICE	HF/CW	MF/CW
243.0 MHz	121.5 MHz	2182 kHz	8364 kHz	500 kHz

c. DISTRESS or URGENCY CALL and MESSAGE

(1) Transmit as many of the following elements as necessary:

(a) *Distress, MAYDAY (3 times) or **Urgency, PAN PAN (3 times).

(b) Name of station addressed.

(c) Aircraft identification and type.

(d) Nature of distress or urgency.

(e) Weather.

(f) Pilot's intention (bailout, ditching, crash landing, etc.) and request (fix, steer, escort, etc.)

(g) Present position and heading. If unknown, last known position, time and heading since that position.

(h) Altitude or Flight Level.

(i) Fuel in hours and minutes.

(j) Numbers of persons on board.

(k) Any other information that might be helpful.

(2) When in *DISTRESS CONDITION with bailout, crash landing imminent, transmit the above information (time and circumstances permitting) plus:

(a) ELT status.

(b) Landmarks.

(c) Aircraft color.

(d) Emergency equipment available on board.

(3) Set radio for continuous transmission for bailout and for crash landing or ditching (if risk of fire is not a consideration).

EMERGENCY PROCEDURES A-3

* DISTRESS - Call MAYDAY (voice) or SOS (CW): When you are threatened by serious and or imminent danger and require immediate assistance (e.g., ditching, crash landing or abandoning aircraft).

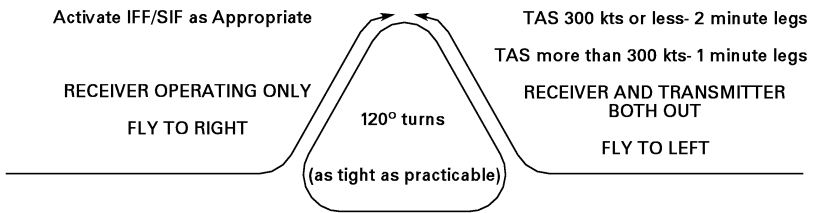
** URGENCY - Call PAN PAN (voice) or XXX (CW): When a condition concerning the safety of an aircraft or other vehicle, or of some person on board or within sight but does not require immediate assistance (e.g., lost, fuel shortage, partial engine failure, etc)

d. CANCELLATION - When an aircraft is no longer in distress, a cancellation message shall be immediately transmitted on the same frequency or frequencies used for the distress message.

e. RADAR DISTRESS SIGNAL PROCEDURE FOR NATO OPERATIONAL AIR TRAFFIC (OAT) FLIGHTS)

(NATO STANAG 3530 ED 3)

(1) If able to fly a pattern which could be identified by a ground radar station, NATO OAT flights which experience radio and or navigational aid failure may initiate the following procedure:



(2) Fly two patterns, resume course, repeat at 20 minute intervals. Guard emergency frequencies.

f. EMERGENCY PROCEDURES UNITED KINGDOM

(RAF P/1, PART 3, RAF FIH, UK AIP COM 0-6)

(1) Within the United Kingdom FIR's/UIR's, the Royal Air Force is responsible for the provisions of assistance on the International Aeronautical Emergency frequencies. Autotriangulation (DF) coverage on the UHF International Aeronautical Emergency frequency is available over most of the London FIR above 5000 ft and the Scottish FIR above 8500 ft. At the ARTCC's autotriangulation data is supplemented in certain areas by CAA/MATO remote radar coverage. The RAF Distress and Diversion Sections at Prestwick, call sign "SCOTTISH CENTER", and at RAF West Drayton, call sign "LONDON CENTER", serve the areas North and South of 55 00'N respectively. In addition to the services the D and D Sections provide for military aircraft on UHF, a VHF communications and aids service to civil aircraft in emergency is available.

(2) An Emergency communications and aid service is continuously available on 243.0 MHz and 121.5 MHz from a number of military and civil airports and ATC units.

(3) States of emergency are internationally classified as being of two standards -

(a) Distress: The aircraft is threatened by serious and imminent danger and is in need of immediate assistance.

(b) Urgency: The calling station has a very urgent message to transmit concerning the safety of an aircraft, or persons on board or within sight.

(4) An emergency transmission consists of two parts, a preliminary emergency call and the emergency message. The preliminary emergency call should be followed as soon as possible by the message. At the discretion of the aircraft captain the preliminary emergency call may be

A-4 EMERGENCY PROCEDURES

omitted, but its use is strongly recommended in order to ensure the appropriate reaction from ground control agencies.

(a) The emergency call is one of the following -

1. Distress - MAYDAY, MAYDAY, MAYDAY, Aircraft Call sign (3 times).
2. Urgency - PAN PAN, PAN PAN, PAN PAN, Aircraft Call sign (once).

(b) The emergency message is the emergency call plus as much of the following information as is relevant and as time permits -

1. Estimated position and time.
2. Heading true and airspeed indicated.
3. Flight level or altitude.
4. Type of aircraft.
5. Nature of emergency and assistance required.
6. Intention of captain.
7. Endurance remaining.

(5) After the R/T transmissions the aircraft may be requested to transmit suitable signals followed by its call sign to permit DF stations to determine its position.

(6) An aircraft in an emergency should use ATS frequency in use at the time. If not in contact with an ATS agency use either 243.0 or 121.5 MHz. Subject to national procedures, military pilots should use 243.0 MHz as the primary and 121.5 MHz as the secondary frequency; civil and non-UHF equipped aircraft should call on 121.5 MHz. Within Continental Europe the Emergency Call should be addressed to the controlling or nearest suitable agency.

(7) SSR - The pilot of an aircraft encountering a state of emergency and who has previously been directed by ATC to operate the transponder on a specified code, must maintain this code setting unless otherwise advised by ATC. In all other instances, including the case where the pilot has specific reason to believe it to be the best course of action, the transponder should be set to MODE A Code 7700.

(8) FINAL TRANSMISSION - When ditching, crash landing or bailing out is imminent, transmit the aircraft call sign and, if possible, leave the control switch in transmit position.

(9) CANCELLATION - Should the emergency conditions cease to exist, the pilot must immediately transmit a message on the frequency or frequencies on which the emergency transmission was made.

(10) PRACTICE URGENCY CALLS - To exercise both aircrew and air traffic control staffs in emergency recovery procedures, aircrew are encouraged to initiate practice emergencies. These may be either on 243.0 MHz or the frequency in use. Practice on 243.0 MHz are particularly welcome within the Scottish FIR.

(a) Initial Contact - If in receipt of a radar control service from an Air Traffic Control Radar Unit while in a MRSA, a pilot wishing to carry out a practice urgency call should normally use the discrete frequency in use at the time to ensure continuity of control. In other situations, the aircraft captain should consider using the ATC frequency in use at the time, unless the nature of the simulated emergency precludes such a course of action, or the captain wishes to make use of the UHF Emergency Fixer Service.

EMERGENCY PROCEDURES A-5

(b) SAROPS ON/EMERGENCY ON - It is usually necessary to cancel practice urgency calls during search and rescue incidents or actual emergency recoveries. The unclassified codewords "SAROPS ON" and "EMERGENCY ON" are broadcast by the D and D Sections to denote the need to cease or delay practice urgency calls.

(c) R/T PROCEDURES - Practice urgency calls may be initiated using the following procedure.

1. The pilot should transmit "PRACTICE PAN" (3 times) and call sign once and then break transmission, awaiting the D and D controllers reply.

2. The D and D controller will respond with either "(Aircraft call sign), this is (Name) center. Your position is _____, continue PRACTICE PAN." or "(Aircraft call sign), this is (Name) center. Your position is _____, negative PRACTICE PAN. SAROPS ON/EMERGENCY ON".

3. In the event of a negative reply the pilot should leave the emergency frequency and allow at least 10 minutes to elapse before checking whether the restriction still applies. If permission has been given for the practice, the pilot should broadcast "PRACTICE PAN" (once) followed by "(Aircraft call sign) (once) followed by as much of the standard emergency message as is relevant.

(11) RADIO FAILURE - Pilots losing two-way communication shall switch the IFF/SIF to Mode 3 code 7600 and see para 1.e. above.

g. UK AIRMISS REPORTING - As soon as possible after being involved in an AIRMISS, the pilot of a military aircraft is to make an initial report by radio to the controller providing the ATC/ Air Defense Radar Service, or to any ATC agency when not in receipt of a service.

(RAF ES)

2. INTERFERENCE WITH INTERNATIONAL SEARCH AND SATELLITE (SARSAT)

(AFFSA/AFFSA)

Keying either 121.5 MHz or 243.0 MHz for 30 seconds or more will activate the SARSAT. Any activation initiates ground processing to locate the activating transmitter. Historically, inadvertent activations have been inordinately high and cause false alarms which seriously degrade the efficiency of the SAR System. Transmissions on 243.0 and 121.5 must not exceed a 15-second keying limit except in actual emergency or distress situations.

3. RECOMMENDED PROCEDURES FOR AIRCRAFT IN DISTRESS WHEN INTERCEPTED

- a. Attempt radio contact, if possible.
- b. If able to maintain a minimum of 210 knots, get in trail formation and the interceptor will lead you to the nearest suitable airport.
- c. If unable to maintain a minimum of 210 knots, the interceptor will fly in the direction you should fly, circle to the left and again fly in the proper direction. This procedure will be repeated until the area for descent is reached. The interceptor will circle to the right over the area where you should descend. The distressed aircraft should let down in a descending turn at minimum rate of descent.

4. RECOMMENDED PROCEDURES FOR THE INTERCEPTOR AFTER INTERCEPTION

- a. Reduce speed for formation flight or maximum endurance, as required.
- b. Attempt radio contact, if possible.
- c. Inform controller of contact and follow instructions.

A-6 EMERGENCY PROCEDURES

d. If distressed aircraft can maintain minimum of 210 knots, lead to suitable airport as directed by the controller.

e. If distressed aircraft cannot maintain minimum of 210 knots, lead the aircraft, as recommended in 3.c. above, to the location directed by the controller.

f. If the interceptor must leave the distressed aircraft.

(1) If the interceptor turns its lights from steady to blinking for 15 seconds, then breaks formation with lights blinking (night) or wings rocking (day), the distressed aircraft should continue on course.

(2) If the interceptor turns its lights from steady to blinking for 30 seconds, then back to steady and breaks formation with lights on steady (night) or fishtails (day), the distressed aircraft should resume distress orbit.

5. TWO-WAY RADIO FAILURE

a. FAA PROCEDURES

(AIM, FAR 91.185)

(1) IFR FLIGHT PLAN

(a) During two-way radio communications failure, when confronted with a situation not covered in the regulation, pilots are expected to exercise good judgment in whatever action they elect to take. Should the situation so dictate, they should not be reluctant to use the emergency actions contained in flying regulations.

(b) In areas of FAA jurisdiction, should the pilot of an aircraft equipped with a coded radar beacon transponder experience a loss of two-way radio capability, the transponder should be adjusted to reply on Mode 3/A, Code 7600.

(c) Pilots can expect ATC to attempt to communicate by transmitting on guard frequencies and available frequencies of nav aids.

(d) VMC - If able to maintain flight in VMC continue flight under VFR and land as soon as practicable and notify ATC. It is not intended that the requirement to "land as soon as practicable" be construed to mean "as soon as possible". The pilot retains his prerogative of exercising his best judgment and is not required to land at an unauthorized airport, at an airport unsuitable for the type of aircraft flown, or to land only minutes short of his intended destination. The primary objective of this provision is to preclude extended IFR operations in the air traffic control system in VMC. When operating "on top" and unable to descend VMC prior to destination, the procedures contained in paragraph (e) below apply.

(e) IMC - If VMC is not encountered, continue the flight according to the following:

1. ROUTE

(FAR 91.185)

a. By the route assigned in the last ATC clearance received;

b. If being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance;

c. In the absence of an assigned route, by the route that ATC has advised may be expected in a further clearance; or

d. In the absence of an assigned route or a route that ATC has advised may be expected in a further clearance, by the route filed in the flight plan.

2. ALTITUDE - At the highest of the following altitudes or flight levels for the route segment being flown:

EMERGENCY PROCEDURES A-7

- a. The altitude or flight level assigned in the last ATC clearance received;
- b. The minimum altitude (converted, if appropriate, to minimum flight level) for IFR operations (see Section B, Altimeter Changeover Procedures); or
- c. The altitude or flight level ATC has advised may be expected in a further clearance.

NOTE - The intent of the rule is that a pilot who has experienced two-way radio failure should select the appropriate altitude for the particular route segment being flown and make the necessary altitude adjustments for subsequent route segments. If the pilot received an "expect further clearance" containing a higher altitude to expect at a specified time or fix, maintain the highest of the following altitudes until that time/fix:

- (1) the last assigned altitude, or
- (2) the minimum altitude/flight level for IFR operations.

Upon reaching the time/fix specified, the pilot should commence climbing to the altitude advised to expect. If the radio failure occurs after the time/fix specified, the altitude to be expected is not applicable and the pilot should maintain an altitude consistent with a. or b. above.

If the pilot receives an "expect further clearance" containing a lower altitude, the pilot should maintain the highest of 1 or 2 above until that time/fix specified in paragraph 3. LEAVE CLEARANCE LIMIT, below.

3. LEAVE CLEARANCE LIMIT.

a. When the clearance limit is a fix from which an approach begins, commence descent or descent and approach as close as possible to the expect further clearance time if one has been received, or if one has not been received, as close as possible to the expected time of arrival as calculated from the filed or amended (with ATC) estimated time enroute.

b. If the clearance limit is not a fix from which an approach begins, leave the clearance limit at the expect further clearance time if one has been received, or if none has been received, upon arrival over the clearance limit, and proceed to a fix from which an approach begins and commence descent or descent and approach as close as possible to the estimated time of arrival as calculated from the filed or amended (with ATC) estimated time enroute.

4. RADAR APPROACHES - initiate lost communications procedures if no transmissions are received for approximately one minute while being vectored to final, 15 seconds while on ASR final approach, or five seconds while on PAR final approach.

(AIM 51-37, FAA 7110.65)

a. Attempt contact on a secondary frequency, the previously assigned frequency, the tower frequency, or guard.

b. If unable to re-establish communications and unable to maintain VMC, proceed with a published instrument approach procedure or previously coordinated instructions. Change transponder to appropriate codes.

c. Maintain the last assigned altitude or the minimum safe/sector altitude (emergency safe altitude if more than 25 NM from the facility), whichever is higher, until established on a segment of the published approach.

5. AERIAL REFUELING

(FAA 7610.4)

a. Squawk Code 7600 for at least 2 minutes prior to exiting the Track or Anchor. After exit, continue squawk in accordance with "Procedures for Two-way Radio Failure IFR-VFR".

b. Tanker aircraft which have not received altitude instructions beyond the exit point shall exit the Track or Anchor at the highest altitude in the clearance for the refueling portion of the flight and proceed in accordance with "Procedures for Two Way Radio Failure IFR-VFR".

A-8 EMERGENCY PROCEDURES

c. Receiver aircraft which have not received altitude instructions beyond the exit point shall exit the Track or Anchor at the lowest altitude specified in the clearance for the refueling portion of the flight and proceed in accordance with "Procedures for Two Way Radio Failure IFR-VFR".

d. Tanker aircraft enroute to an anchor aerial refueling pattern, which have not received ATC clearance to conduct aerial refueling, should proceed to the anchor point, then proceed direct to the A/R Exit Point (AREX) without delay and then follow lost communications procedures outlined in this section.

b. ICAO PROCEDURES

(ICAO ANNEX 2)

(1) If in visual meteorological conditions, the aircraft shall:

(a) Continue to fly in visual meteorological conditions;

(b) Land at the nearest suitable aerodrome and;

(c) Report its arrival by the most expeditious means to the appropriate air traffic control unit.

(2) If in instrument meteorological conditions or when conditions are such that it does not appear feasible to complete the flight in accordance with paragraph (1) above (see Note 1 below), the aircraft shall:

(a) Unless otherwise prescribed on the basis of regional air navigation agreement, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan;

(b) Proceed according to the current flight plan route to the appropriate designated navigation aid serving the destination aerodrome and, when required to ensure compliance with (c) below, hold over this aid until commencement of descent;

(c) Commence descent from the navigation aid specified in (b) above at, or as close as possible to, the expected approach time last received and acknowledged; or, if no expected approach time has been received and acknowledged, at, or as close as possible to, the estimated time of arrival resulting from the current flight plan;

(d) Complete a normal instrument approach procedure as specified for the designated navigation aid; and

(e) Land, if possible, within thirty minutes after the estimated time of arrival specified in (c) above or the last acknowledged expected approach time, whichever is later.

NOTE 1. - As evidenced by the meteorological conditions prescribed therein, paragraph (1) above relates to all controlled flights, whereas paragraph (2) relates only to IFR flights.

NOTE 2. - The provision of air traffic control service to other flights operating in the airspace concerned will be based on the premise that an aircraft experiencing communication failure will comply with the rules in paragraph (2) above.

(SPEC/ICAO ANNEX 2; 3.6.5.2)

(3) UNDER RADAR CONTROL - ATC will attempt to communicate by transmitting on all suitable air ground frequencies as well as on the voice features of all available radio navigational or approach aids, requesting pilot acknowledge by executing suitable turns or IFF/SIF response. The required separation between such aircraft and other aircraft in the area will be predicated on the pilot's course of action as indicated by radar monitor. If a flight is departing or enroute, and a radar vector has taken it off the route specified in the ATC clearance which was delivered before vectors were issued, the pilot will return to the route by the most direct course possible. An aircraft following approach control instructions which has departed from the outer

EMERGENCY PROCEDURES A-9

fix under radar control will proceed by the most direct course possible to the appropriate approach facility and execute approach.

(ICAO DOC 4444)

(4) RECEIVER FAILURE - If only airborne receiver trouble is suspected, transmit on UHF or VHF (as appropriate) and request a reply on 121.5 or 108.3 MHz. Reports must be transmitted at the scheduled times or positions on the frequency in use, preceded by the words "TRANSMITTING BLIND DUE TO RECEIVER FAILURE". The pilot will transmit his intended message following this by a complete repetition. During this procedure, the pilot will also advise the time of next intended transmission.

(ICAO ANNEX 10)

(5) EMERGENCY DESCENT

(ICAO DOC 4444)

(a) Upon receipt of advice that an aircraft is making an emergency descent through other traffic, all possible action will be taken immediately to safeguard all aircraft concerned. When deemed necessary, air traffic control units will immediately broadcast by means of the appropriate radio aids, or if not possible, request the appropriate communications stations to immediately broadcast an emergency message: EMERGENCY DESCENT AT (place) ALL AIRCRAFT BELOW (level) WITHIN (distance) OF (place or navigation aid) LEAVE IMMEDIATELY, (followed as necessary by specific instructions as to heading or track, etc).

(b) ACTION BY THE PILOT-IN-COMMAND - It is expected that aircraft receiving such a broadcast will clear the specified areas and stand-by on the appropriate radio frequency for further clearances from the air traffic control unit.

(c) SUBSEQUENT ACTION BY THE AIR TRAFFIC CONTROL UNIT - Immediately after such an emergency broadcast has been made the ACC, the approach control office, or the airport control tower concerned will forward further clearances to all aircraft involved as to additional procedures to be followed during and subsequent to the emergency descent.

c. VISUAL SIGNALS WHEN RADIO INOPERATIVE

(AFI 11-205)

NOTE - Signals which have been standardized with NATO and used by Air Force are marked with an asterisk (*).

(1) DAY VISUAL SIGNALS

(a) DESCEND TO LOWER ALTITUDE - Hold hand at top of canopy, palm down, fingers extended and joined, move hand forward and down.

(b) SYSTEM FAILURES: HEFOE System - Clench fist and hold it at top of canopy, then hold up the required number of fingers to denote which system is involved (see 1. through 5. below). If the clenched fist signal is seen but no finger signal is received or the intercepting pilot is unable to understand the signal given, the pilot will assume that the aircraft in distress has one or more systems inoperable and should proceed with extreme caution. The receiving pilot acknowledges the signal by repeating it. (*)

1. Hydraulic - one finger.
2. Electrical - two fingers.
3. Fuel - three fingers.
4. Oxygen - four fingers.
5. Engine - five fingers.

(c) I MUST LAND ON YOUR WING - Pat shoulder, palm down; to prevent confusion with other signals, use right hand for left shoulder and vice versa. To acknowledge, other

A-10 EMERGENCY PROCEDURES

pilot must give an OK signal; the basic signal indicates a jet approach speed of 130 knots. If the distress aircraft desires a higher approach speed, the pilot must raise one finger for each 10-knot increase desired. The distressed aircraft lands and the escort executes a go-around.

(d) **LAND IMMEDIATELY** - Close fist and hold it to top of canopy with thumb extended downward, then move arm up and down rapidly. (Do not confuse signal with "GEAR DOWN" signal, which is generally not used at altitude.)

(e) **RADIO INOPERATIVE LANDING (NO ASSIST AIRCRAFT AVAILABLE)** - Fly aircraft along the side of landing runway, 1000 feet above the field elevation, rocking wings until reaching end of the runway. Turn to downwind and check mobile control or tower for green light on base leg and final approach.

(f) **RADIO FAILURE** - Tap microphone or earphone and signal as appropriate. (*)

1. **RECEIVER FAILURE** - With palm of hand over ear position, move hand forward and backward.

2. **TRANSMITTER FAILURE** - With palm of hand toward and in front of the face, move hand up and down.

(g) **COMPLETE ELECTRICAL FAILURE LANDING (NO ASSIST AIRCRAFT AVAILABLE)** - Distressed aircraft will fly 500 feet over mobile control or tower, then continue to the far end of the runway and pull up into a wide downwind leg. Proceed with a pattern and landing appropriate for the type aircraft being flown, while watching mobile or tower for signals. The control tower will clear the area of other aircraft and will call the emergency crash equipment to scene.

(h) **BAILING OUT OR EJECTION** - One or both clenched fists pulled downward across the face to simulate pulling the ejection face curtain. (*)

(i) **DESIRE TO LAND** - Movement of the hand, flat, with palm down, forward and downward, finishing the movement in a simulated roundout. As an alternate signal, lower the landing gear. (*)

(j) **INTERCEPTING SIGNALS** - The intercepting aircraft positions itself in front of and usually to the left of the intercepted aircraft and rocks its wings. This is a signal that the interceptor wishes the other aircraft to follow it. The responding porpoising signal in this case indicates distress. (*)

(k) **APPROACH END BARRIER ENGAGEMENT:**

1. **Escorted** - Extended tail hook.

2. **Unescorted** - Fly parallel to active runway at 1000 feet above ground level (AGL) with tail hook extended. Rock wings until reaching departure end of runway, turn to downwind and check mobile control or tower for light signal. If a straight-in barrier engagement must be flown, flash landing light on final.

(2) **NIGHT VISUAL SIGNALS**

(a) **ATTENTION** - Attention should first be attracted by switching on the landing light, or other means of illumination.

(b) **AIRCRAFT EMERGENCY (MUST LAND AS SOON AS POSSIBLE)** - Signal escort aircraft by repeated intermittent flashes with a flashlight, then assume the wing position. This signal indicates a jet approach speed of 130 knots. If a higher approach speed is desired, the pilot must pause after the basic signal, and then blink flashlight at the top of the canopy, once for each 10-knot increase desired. The escort pilot will lead to the nearest suitable field, declare an emergency with the controlling agency, then fly a straight-in approach with the distressed aircraft on the wing. The distressed aircraft lands and escort executes a go-around. (*)

NOTE - On a straight-in approach, the escort aircraft turns the position lights to bright and steady to alert the wingman to prepare to lower flaps and landing gear. The corresponding signal of

EMERGENCY PROCEDURES A-11

execution will be for the lead escort aircraft to return position lights to dim and steady. However, if the aircraft is equipped only with a steady-bright light position, the lead escort will blink lights for the alerting signal of execution.

(c) **CHANGE LEAD** - Pilot of distressed aircraft holds flashlight parallel with canopy rail and sends a steady light while making a straight line from rear toward the front of the canopy.

(d) **COMPLETE ELECTRICAL FAILURE LANDING (NO ASSIST AIRCRAFT AVAILABLE)** - Procedure same as prescribed for day visual signal. (*)

(e) **DESCEND TO LOWEST PRACTICAL ALTITUDE** - The pilot makes a rapid vertical movement with a flashlight.

(f) **RADIO INOPERATIVE LANDING** - Same as day signal procedure.

(g) **SIGNAL ACKNOWLEDGMENT** - Point a steady light from the flashlight at the signaling aircraft.

(h) **APPROACH END BARRIER ENGAGEMENT** - Fly parallel to active runway at 1000 feet AGL with gear down and flash landing light. Turn downwind and check mobile control or control tower for light signal. If a straight-in barrier engagement must be flown, flash landing light on final.

(3) INFORMATION SIGNALS

(a) **FUEL CHECK** - Close fist with the thumb extended, and perform drinking motion with thumb touching the oxygen mask.

(b) **FUEL REMAINING** - Extend one finger for each 1000 pounds of fuel on board. Extend finger(s) vertically for 1000-5000 pounds; horizontally for 6000-9000 pounds. After signaling 1000 pound increments, pull hand down out of sight then signal 100 pound increments in the same manner. Signal zero with closed fist.

EXAMPLE 1 - To signal 6600 pounds, extend one finger horizontally (indicating 6000 pounds); pull hand down out of sight (indicating a change from thousands to hundreds) extend one finger horizontally (indicating 600 pounds).

EXAMPLE 2 - To signal 13,800 pounds extend one finger vertically, then three fingers vertically (indicating 13,000 pounds); pull hand down out of sight (indicating change from thousands to hundreds), then extend three fingers horizontally (indicating 800 pounds).

EXAMPLE 3 - If the pilot has been briefed to signal gallons, extend finger(s) vertically for 100-500 gallons; horizontally for 600-900 gallon increments. (After signaling 100 gallon increments, pull hand down out of sight; then signal 10 gallon increments in the same manner as above.)

(4) **AIRPORT TRAFFIC CONTROL LIGHT SIGNALS** - Aircraft without radio equipment should observe the tower for light signals. Acknowledge signals in the daytime by movement of ailerons or rudder on the ground and by rocking wings in the air. Acknowledge signals at night by flashing aircraft lights. Signals from an airport traffic control light gun have the following meanings:

(ICAO ANNEX 2)

COLOR & TYPE OF SIGNAL	ON THE GROUND	IN FLIGHT
STEADY GREEN	Cleared for take-off	Cleared to land
FLASHING GREEN	Cleared to taxi	Return for landing (to be followed by steady green at proper time)
STEADY RED	Stop	Give way to other aircraft and continue circling.

A-12 EMERGENCY PROCEDURES

COLOR & TYPE OF SIGNAL	ON THE GROUND	IN FLIGHT
FLASHING RED	Taxi clear of landing area (runway) in use	Airport unsafe - do not land.
FLASHING WHITE	Return to starting point on airport.	① Land at this airport and proceed to apron. Clearance to land and to taxi will be given in due course.
ALTERNATING RED & GREEN	General Warning Signal - Exercise Extreme Caution	
RED PYROTECHNIC (RED FLARE)		Notwithstanding any previous instructions, do not land for the time being.
① ICAO-Procedure. FAA not applicable.		

d. COUNTRY/THEATER EXCEPTIONS TO STANDARD PROCEDURES

(1) ICAO AIR-GROUND COMMUNICATIONS FAILURE EUROPE

As soon as it is known that two-way communication has failed, ATC shall maintain separation between the aircraft having the communication failure and other aircraft based on the assumption that the aircraft will operate in accordance with the subparagraphs (a) and (b) below.

(a) Visual Meteorological Conditions (VMC) - Except as provided for in paragraph (b) below, a controlled flight experiencing communication failure in VMC shall:

- 1. Set transponder to Code 7600
- 2. Continue to fly in VMC
- 3. Land at the nearest suitable aerodrome
- 4. Report its arrival time by the most expeditious means to the appropriate ATS

unit

(b) Instrument Meteorological Conditions (IMC) - A controlled IFR flight experiencing communication failure in IMC, or where it does not appear feasible to continue in accordance with paragraph (a) above shall:

- 1. Set transponder Code 7600
- 2. Maintain for a period of 7 minutes the last assigned speed and level or the minimum flight altitude, if the minimum flight altitude is higher than the last assigned level. The period of 7 minutes commences:

a. if operating on a route without compulsory reporting points or if instructions have been received to omit position reports:

- (1) At the time the last assigned level or minimum flight altitude is reached, or
- (2) At the time the transponder is set to Code 7600 whichever is later,

or

b. If operating on a route with compulsory reporting points and no instructions to omit position reports has been received:

- (1) At the time the last assigned level or minimum flight altitude is reached, or
- (2) At the previously reported pilot estimate for the compulsory reporting point, or

EMERGENCY PROCEDURES A-13

(3) At the time of a failed report of position over a compulsory reporting point, whichever is later;

NOTE: The period of 7 minutes is to allow the necessary air traffic control and coordination measures.

3. Thereafter, adjust level and speed in accordance with the filed flight plan;

NOTE: With regard to changes to levels and speed, the filed flight plan, which is the flight plan as filed with an ATS unit by the pilot or a designated representative without any subsequent changes, will be used.

4. If being radar vectored or proceeding offset according to RNAV without a specified limit, proceed in the most direct manner possible to rejoin the current flight plan route no later than the next significant point, taking into consideration the application minimum flight altitude;

NOTE: With regard to the route to be flown or the time to begin descent to the arrival aerodrome, the current flight plan, which is the flight plan, including changes, if any, brought about by subsequent clearances, will be used.

5. Proceed according to the current flight plan route to the appropriate designated navigation aid serving the destination aerodrome and, when required to ensure compliance with paragraph 6. below, hold over this aid until commencement of descent;

6. Commence descent from the navigation aid specified in paragraph 5. above at, or as close as possible to, the expected approach time last received and acknowledged or, if no expected approach time has been received and acknowledged, at, or as close to as possible to, the estimate time of arrival resulting from the current flight plan;

7. Complete a normal instrument approach procedure as specified for the designated navigation aid; and

8. Land, if possible, within thirty minutes after the estimated time of arrival specified in paragraph 6. above or the last acknowledged expected approach time, whichever is later.

NOTE: Pilots are reminded that the aircraft may not be in an area of secondary surveillance radar coverage.

(SPEC/ICAO 7030/4 Amdt 201)

(2) BAHRAIN

(a) IMC

1. Departing Bahrain Intl under radar control maintain last assigned heading and flight level or altitude for three (3) minutes or to BAH 12 DME, whichever comes first. Then continue as filed or as cleared, whichever is applicable, by proceeding direct to first enroute reporting point and climbing to last acknowledged enroute flight level assigned by ATC.

(AIP RAC 1-2.1)

(3) DENMARK

(a) RADIO COMMUNICATION FAILURE PROCEDURES

1. Reference DOC 7030/4-ER Part 1.

2. IFR departure and IFR arrival: Two way radio communication failure procedures of DOC 7030 are in force for airports except SID and STAR for Copenhagen/Kastrup and IFR DEP for Copenhagen/Roskilde airports where local procedures have been established.

(SPEC/CIV ENR 1.8-1)

a. From aerodromes where Standard Instrument Departures or other departure procedures are not established, and where no radio communication failure procedures

A-14 EMERGENCY PROCEDURES

are established, the following procedure shall be applied by departing controlled IFR-flights operating in IMC in the event of two-way radio communication failure:

(1) If the flight has acknowledged an initial or intermediate clearance to climb to a level other than the one specified in the current flight plan for the en-route phase of the flight shall, if no time limit or geographical limit was included in the climb clearance, maintain for a period of three minutes the level to which it was cleared and then continue its flight in accordance with the current flight plan.

(2) A departing controlled IFR flight being vectored by radar away from the route specified in its current flight plan and experiencing two-way radio communication failure should proceed in the most direct manner to the route specified in the current flight plan.

2. IFR arrival

a. At some aerodromes, local procedures are in force for arriving IFR aircraft experiencing two-way radio communication failure to be observed in addition to the procedures of Annex 2. Local procedures and designated navigational aids are shown, for each individual aerodrome in AIP Volume-II.

b. If two-way radio communication fails while an aircraft is under radar control during the approach phase, the aircraft shall continue the approach to the runway in use by other radio aids or visually.

c. If this procedure is not possible, the aircraft should climb/descend to the transition altitude for the aerodrome concerned and perform the approach to the most suitable runway.

(4) **FRANCE**

(a) IFR GAT FLIGHT RADIO COMMUNICATION PROCEDURES: France follows the ICAO AIR-GROUND COMMUNICATIONS EUROPE procedures with the following exceptions:

1. In IMC, instead of proceeding according to the current flight plan route to the appropriate designated **navigation aid** serving the destination aerodrome and holding over the aid, flights are to proceed to the appropriate **initial approach fix (IAF)**, hold over this fix, and commence descent from this fix.

2. Pilots are to complete the normal instrument approach as specified for the IAF.

(SPEC/AIP ENR 1.3-4)

(b) OAT FLIGHT RADIO COMMUNICATION FAILURE PROCEDURES

1. OAT TYPE V - Maintain VMC to land at an appropriate airport (destination or alternate). Squawk Mode 3/A 7600 at 10 NM from airport.

2. OAT TYPE A, B AND C - If continuation of flight to destination is possible using independent navigation and approach facilities, squawk Mode 3/A, Code 7600 and proceed in accordance with last instructions received and flight plan. Otherwise, squawk EMERGENCY Mode 3/A, Code 7700 and head toward the nearest appropriate airport with all navigation and anti-collision lights on. Fly the radar distress pattern and alternating 5-minute race track patterns to the left. If not intercepted by escort aircraft and fuel endurance dictates, carry out the arrival, approach and landing procedures appropriate for the facilities being used. If in VMC with sight of the ground, the pilot may elect to fly VFR. In this case the pilot should leave the upper airspace, squawk mode 3/A 1300, maintain sight of ground and follow the OAT V instructions.

(SPEC/MIL ENR 1.1-6)

(5) **GERMANY**

(a) RADIO COMMUNICATIONS FAILURE PROCEDURES-GPS/RNAV

EMERGENCY PROCEDURES A-15

(1) After receiving a "TRANSITION" Clearance: Switch transponder immediately to Code A 7600 and continue flight in accordance with lateral and vertical description of the procedure with subsequent final of the published Standard Instrument Arrival Procedure.

(2) After receiving clearance based on individually assigned waypoints: Switch transponder immediately to Code A 7600, continue to fly to the last published waypoint on the downwind, with subsequent turn to final for a published Standard Instrument Arrival Procedure on the runway assigned.

(NOTE: After receiving a "DIRECT TO WAYPOINT" clearance and reaching this point without receiving a follow-up clearance (e.g. due to frequency congestion-no radio communication failure ground/air), the last flown heading exceeding this waypoint shall be maintained).

(3) After receiving a clearance directly to a waypoint on the extended RWY centerline: Switch transponder immediately to Code A 7600, in accordance with cleared waypoint, turning in with subsequent final of a published Standard Instrument Arrival Procedure.

(USAASD-E/CIV AIP Amdt 3, 21 Mar 02, GEN 3.4-43)

(b) WIESBADEN AB AAF

(TFMWGE/USA02-0043)

1. Flights to Wiesbaden AB AAF from the North are expected to file via, and have a clearance limit of Gedern VORTAC. In case of radio communication failure, proceed from Gedern VORTAC to Metro VOR (landing Rwy 25) or from Gedern VORTAC via Metro VOR, thence Taunus VORTAC to Rudesheim NDB (landing Rwy 07).

2. Flights to Wiesbaden AB AAF from the West are expected to file via, and have a clearance limit of Rudesheim NDB. In case of radio communication failure, proceed with the approach from Rudesheim NDB (landing Rwy 08); or from Rudesheim NDB via Frankfurt VORTAC to Metro VOR. Minimum altitude between Rudesheim and Frankfurt shall be 6000 ft (landing Rwy 25).

3. Flights to Wiesbaden AB AAF from the South are expected to file via and have a clearance limit of Spessart NDB. In case of radio communication failure, proceed from Spessart NDB to Gedern VORTAC, thence Metro VOR (landing Rwy 25) or to Gedern VORTAC, thence Metro VOR, thence Taunus VORTAC to Rudesheim NDB (landing Rwy 07). Minimum altitude between Spessart NDB, Gedern VORTAC and Metro VOR shall be 6000 ft.

(4) HONG KONG

(AIP ENR 1.5-24)

(a) IMC

1. Maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan;

2. Should a specific entry beacon have been designated and acknowledged prior to the occurrence of communication failure, proceed according to the current flight plan route to the entry beacon, descend to minimum holding altitude in the holding procedure, then carry out published approach for the designated entry beacon;

3. Should no specific entry beacon have been designated and acknowledged prior to the occurrence of communication failure, proceed according to the current flight plan route to the initial approach fix for the appropriate runway and carry out an ILS approach in accordance with the Standard Terminal Arrival Route (STAR) procedure.

4. The flight shall be arranged to arrive over the approach facility as close as possible to the ETA as indicated in the filed plan and revised in accordance with the current flight

A-16 EMERGENCY PROCEDURES

plan; and

5. Descent shall be commenced as nearly as possible to the EAT last received and acknowledged; or, if no EAT has been received and acknowledged, as nearly as possible to the EAT specified in 4 above.

(5) IRELAND

(a) IMC

1. Aircraft experiencing communication failure shall use the following radio navigational aids:

a. CORK - NEGEL hold for Rwy 17, BANON hold for Rwy 35, UPLON hold for Rwy 07, and RINGI hold for Rwy 25.

b. DUBLIN ACC NORTH - (All routes north of extended centerline Rwy 10-28) - ROKNA hold for ILS approach to Rwy 16 or ILS approach to Rwy 28, and DINIL hold for ILS approach to Rwy 10.

c. DUBLIN ACC SOUTH - (All routes south of extended centerline Rwy 10-28) - NASRI hold for ILS approach to Rwy 10 or ILS approach to Rwy 16, and TULSO hold for ILS approach to Rwy 28.

d. SHANNON - FOYNES NDB (FOY) for ILS approach to Rwy 06, and ENNIS NDB (ENS) for ILS approach to Rwy 06.

(SPEC/ENR 1-3)

(6) ISRAEL

(AIP ENR 1-6-2)

(a) RECEIVER FAILURE (Squawk Mode 3/A Code 7600) - Follow established procedures.

(b) TWO-WAY FAILURE (Squawk Mode 3/A Code 7600)

1. DEPARTURES

a. After take-off, return to base, if practical, or:

b. Carry-out any other decision within the bounds of flight safety.

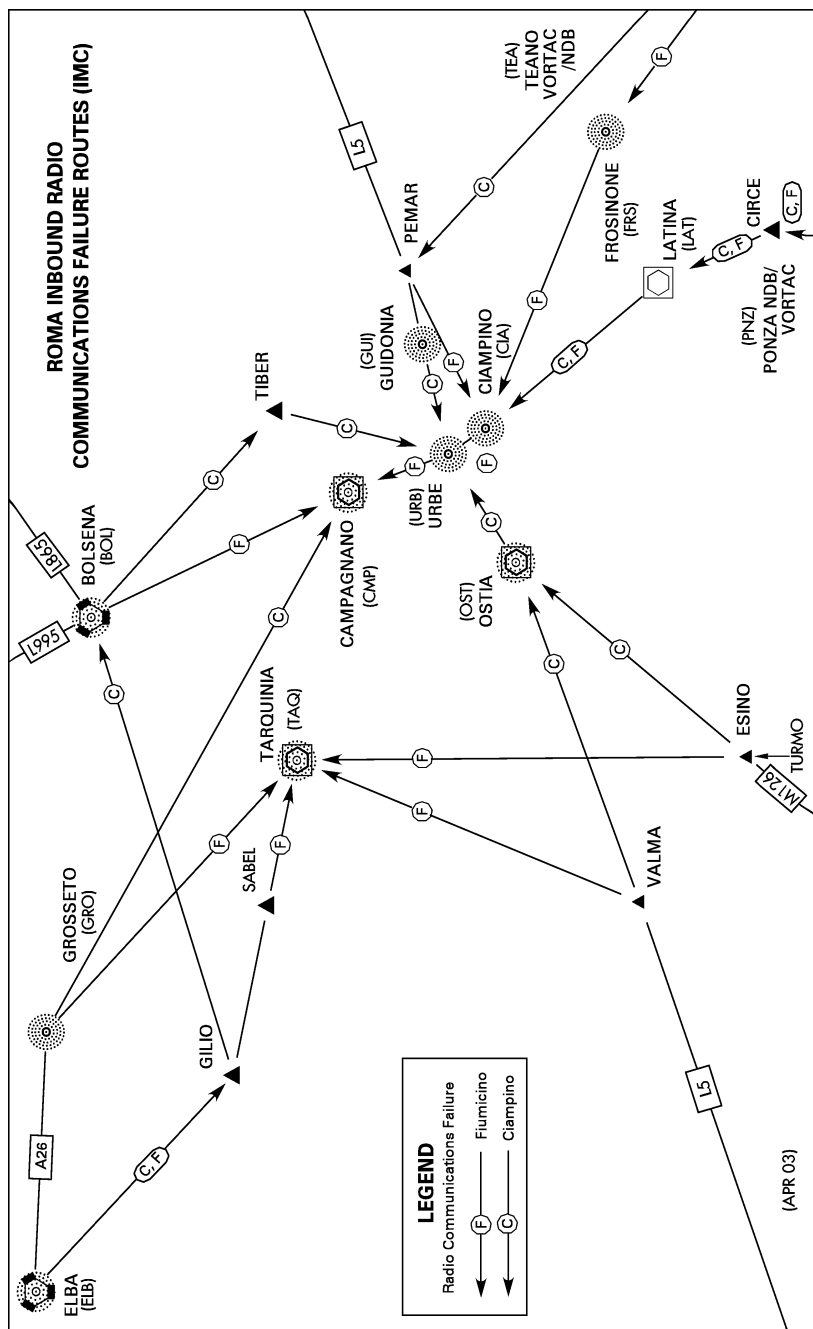
2. ARRIVALS - Proceed to the facility listed below for destination, maintaining last assigned altitude or FL. Arrange arrival as near the ETA as possible, provided an expected approach time has been acknowledged. Descend at, or as nearly as possible to, ETA+10 min and execute instrument approach procedure.

(7) ITALY

(AIP RAC 4)

(a) If an en-route IFR flight operating in IMC experiences an air-ground communications failure, the pilot shall comply with the ICAO two-way radio failure procedures on p. A-8 unless noted below.

(RAC 1-41 Para 11.1)



A-18 EMERGENCY PROCEDURES

(b) If a departing controlled IFR flight operating in IMC experiences an air-ground communication failure and no definite cruising level has been assigned to the pilot, he shall, after having set transponder to code 7600, maintain the level assigned by ATC for a period of 3 minutes and then continue his climb to the cruising level indicated in the field flight plan.

(RAC 1-41 Para 11.2)

1. If, during the above mentioned 3 minutes of flight, the minimum IFR en-route level is higher than the level assigned by ATC, the pilot shall climb to the minimum IFR en-route level.

2. If the departing aircraft has been vectored by radar away from the route specified in its current flight plan, the pilot shall proceed in the most direct manner to the route specified in the current flight plan.

(c) AVIANO AB - Lost communications procedures are as follows:

1. If no transmissions received for 30 seconds in the pattern or 5/15 seconds on final approach, attempt contact on 362.3 and proceed VFR.

2. If unable, maintain 3000 feet until established on final and proceed with TACAN RWY 5 approach.

(FIL LTR 11/84)

(d) MILANO TCA Radio Failure/Lost Communication

(RAC 4-1-1.4 Para 5.2)

For arriving aircraft: In the event of radio failure, the aircraft in IMC shall comply with the following procedures:

1. The non-radar vectored aircraft on a standard instrument arrival route shall maintain the latest assigned level and proceed to the radio aid associated with the STAR performing the approach procedure according to ICAO regulation in force (Annex 2 Para 3.6.5.2.2);

2. The radar-vectored aircraft outside a standard instrument arrival route shall resume the above route by the shortest way and comply with the procedure in 1.

(e) ROMA TCA Radio Failure/Lost Communication

(RAC 4-2-2.2.2 Para 5.1.5)

For arriving aircraft: In the event of radio failure during radar vectoring, arriving aircraft shall maintain the last assigned level assuming the direct track to the designated navigation aid as follows:

(RAC 4-2-0.30 Para 2.5.2)

1. If bound to Roma/Ciampino airport shall comply with procedures in Roma CTLZ:

(RAC 4-2-2.2.2 Para 5.1.5)

a. In the event of radio failure, the radio aid designated to descent for landing is URB NDB. In the event of URB NDB failure, the radio aid designated for landing is CIA NDB.

b. When radio failure occurs after the aircraft has left URB NDB or (CIA NDB), for the approach, if in IMC, the pilot shall act as follows:

1. If no radar vector has been received and the aircraft is performing the instrument approach procedure it shall proceed according to the prescribed procedure;

2. If a radar vector has been received so as to be carried out of the published instrument approach route, it shall resume the above route by the shortest way and comply with the mentioned procedure

EMERGENCY PROCEDURES A-19

2. If bound to Roma/Fiumicino airport shall comply with procedures in Roma CTLZ:
(RAC 4-2-2.20 Para 5.2.4)

a. In the event of radio failure, the radio aid designed to descent for landing is TAQ NDB/VOR or CMP NDB/VOR depending on the STAR flown entering Roma TCA;

b. When parallel ILS approaches are in progress for Rwy 16C and 16R, or 16L and 16R, an aircraft experiencing radio failure arriving via TAQ must land on Rwy 16R; an aircraft experiencing radio failure arriving via CMP must land on Rwy 16L or 16C, whichever in use;

c. If the radio failure occurs after aircraft has left TAQ NDB/VOR or CMP NDB/VOR or CIA NDB, for the approach, if in IMC, it shall act as follows:

1. If no radar vector has been received and the aircraft is performing the instrument approach procedure it shall proceed according to the prescribed procedure;

2. If a radar vector has been received so as to be carried out of the published instrument approach procedure route, the aircraft shall resume the above route by the shortest way and comply with the mentioned procedure.

3. If bound to Roma/Urbe airport shall comply with procedures described for Roma/Ciampino airport.
(RAC 4-2-0.30 Para 2.5.2)

For departing aircraft: In the event of radio failure, aircraft departing from airports located within Roma CTLZ shall:
(RAC 4-2-0.30 Para 2.6.2)

1. If they did not receive a radar vector which has conducted them outside the SID routes, comply with the ICAO procedures in force;

2. If they have received a radar vector which has conducted them outside the standard instrument outbound routes and they are in IMC, make a direct track toward the nearest SID route and then comply with the ICAO procedure in force.

(f) CAPODICHINO CTLZ Radio Failure/Lost Communication
(RAC 4-2-3.3 Para 5.4.4)

1. Arriving aircraft:

a. If they are following the standard inbound routes, they shall perform the ICAO radio failure procedures;

b. If a radar vector has been received which took them off the standard inbound routes, and they are in IMC, they shall maintain the last level assigned and proceed with the shortest route to POM VOR DME/NDB.

2. Departing aircraft:

a. If they are following the standard route assigned in the procedural clearance, they shall perform the ICAO radio failure procedures;

b. If they have received a radar vector which took them off the standard route specified in the procedural clearance, they shall regain such route in the shortest way and then they shall adopt the ICAO radio failure procedures.

(8) JAPAN - LOST COMMUNICATIONS PROCEDURE FOR ARRIVAL AIRCRAFT UNDER RADAR CONTROL

(a) FUKUOKA - If radio communications with Fukuoka Approach/Radar are lost for 30 seconds after radar contact, squawk Mode A/3 Code 7600 and contact Fukuoka Tower, or
(AIP MINIATURE ED., 14-13)

A-20 EMERGENCY PROCEDURES

1. If unable, proceed in accordance with visual flight rules, or

2. If unable, proceed to Fukuoka VORTAC/NDB at the last assigned altitude or 5000 feet, whichever is higher, and execute the instrument approach.

3. Procedures other than above will be issued when the situation requires.

(b) HIROSHIMA - If radio communications with Hiroshima Approach/Radar are lost for 30 seconds, squawk Mode A/3 Code 7600 and attempt to contact Hiroshima Tower, or
(AIP, MINIATURE ED., 22-60)

1. If unable, proceed in accordance with visual flight rules, or

2. If unable, proceed to Hongo VOR/DME at the last assigned altitude or 4000 feet, whichever is higher, and execute the instrument approach.

3. Procedures other than above will be issued when the situation requires.

(c) KAGOSHIMA - If radio communications with Kagoshima Approach/Radar are lost for 30 seconds after radar contact, squawk Mode A/3 Code 7600 and attempt to contact Kagoshima Tower, or
(AIP, MINIATURE ED., 35-9)

1. If unable, proceed in accordance with visual flight rules, or

2. If unable, proceed to Kokubu VOR at the last assigned altitude or 3500 feet, whichever is higher, and execute the instrument approach.

3. Procedures other than above will be issued when the situation requires.

(d) KUMAMOTO - If radio communications with Kumamoto Approach/Radar are lost for 30 seconds after radar contact, squawk Mode A/3 Code 7600 and attempt to contact Kumamoto Tower, or
(AIP, MINIATURE ED., 45-15)

1. If unable, proceed in accordance with visual flight rules, or

2. If unable, maintain the last assigned altitude or 5200 feet, whichever is higher, proceed to Kumamoto VOR/NDB and execute the instrument approach.

3. Procedures other than above will be issued when the situation requires.

(e) MIYAKO - If radio communications with Shimoji Approach/Radar are lost for 1 minute after radar contact, squawk Mode A/3 Code 7600 and attempt to contact Shimoji Tower, or
(AIP, MINIATURE ED., 62-12)

1. If unable, proceed in accordance with visual flight rules, or

2. If unable, proceed to Miyako-Jima VORTAC/NDB or Shimoji-Shima VOR at the last assigned altitude or 2000 feet, whichever is higher, and execute the instrument approach.

3. Procedures other than above will be issued when the situation requires.

(f) MIYAZAKI - If radio communications with Miyazaki Approach/Radar are lost for 30 seconds, squawk Mode A/3 Code 7600 and contact Miyazaki Tower, or
(AIP, MINIATURE ED., 63-10)

1. If unable, proceed in accordance with visual flight rules, or

2. If unable, proceed to Miyazaki VOR/NDB at last assigned altitude or 4500 feet, whichever is higher, and execute the instrument approach.

EMERGENCY PROCEDURES A-21

3. Procedures other than above will be issued when the situation requires.

(g) NAGASAKI - If radio communications with Nagasaki Approach/Radar are lost for 30 seconds after radar contact, squawk Mode A/3 Code 7600 and attempt to contact Nagasaki Tower, or

(AIP, MINIATURE ED., 65-15)

1. If unable, proceed in accordance with visual flight rules, or
2. If unable, proceed to Nagasaki VOR/DME (Omura NDB) at last assigned altitude or 4000 feet, whichever is higher, and execute instrument approach.
3. Procedures other than above will be issued when the situation requires.

(h) NYUTABARU - If radio communications with Miyazaki Approach/Radar are lost for 1 minute, squawk Mode A/3 Code 7600 and contact Nyuta Tower, or

(AIP, MINIATURE ED., 74-15)

1. If unable, proceed in accordance with visual flight rules, or
2. If unable, proceed to Nyutabaru TACAN NR.1 IAF at last assigned altitude or 4000 feet, whichever is higher, and execute the instrument approach.
3. Procedures other than above will be issued when the situation requires.

(i) OITA - If radio communications with Oita Approach/Radar are lost for 30 seconds, squawk Mode A/3 Code 7600 and contact Oita Tower, or

(AIP, MINIATURE ED., 76-12)

1. If unable, proceed in accordance with visual flight rules, or
2. If unable, proceed to Musasi VOR/DME at last assigned altitude or 3500 feet, whichever is higher, and execute the instrument approach.
3. Procedures other than above will be issued when the situation requires.

(j) SENDAI - If radio communications with Sendai Approach/Radar are lost for 1 minute after radar contact, squawk Mode A/3 Code 7600 and attempt to contact Sendai Tower, or

(AIP, MINIATURE ED., 93-15)

1. If unable, proceed in accordance with visual flight rules, or
2. If unable, proceed to Sendai VOR-DME/NDB at last assigned altitude or 3000 feet, whichever is higher, and execute the instrument approach.
3. Procedures other than above will be issued when the situation requires.

(k) SHIMOJI-SHIMA - If radio communications with Shimoji Approach/Radar are lost for 1 minute after radio contact, squawk Mode A/3 Code 7600 and attempt to contact Shimoji Tower, or

(AIP, MINIATURE ED., 95-13)

1. If unable, proceed in accordance with visual flight rules, or
2. If unable, proceed to Miyako-Jima VORTAC/NDB or Shimoji- Shima VOR at last assigned altitude or 2000 feet, whichever is higher, and execute the instrument approach.
3. Procedures other than above will be issued when the situation requires.

(l) TOKYO INTERNATIONAL (HANEDA) - If radio communications with Tokyo Approach/Radar are lost for 1 minute after radar contact, squawk Mode A/3 Code 7600 and attempt to contact Tokyo Tower, or

(AIP, MINIATURE ED., 104-43)

A-22 EMERGENCY PROCEDURES

1. If unable, proceed in accordance with visual flight rules, or
2. If unable,

a. When Rwy 34L or Rwy 34R in use proceed to TOMAS, MICKY, Kisarazu VOR/DME or CL NDB at last assigned altitude or 3000 feet, whichever is higher, and execute the instrument approach or

b. When Rwy 22, Rwy 16L or Rwy 16R in use, proceed to DREAM at last assigned altitude or 2000 feet, whichever is higher, and execute the instrument approach.

3. Procedures other than above will be issued when the situation requires.

(9) **NORWAY**

(a) ORLAND DEPARTURES

1. RADIO COMMUNICATIONS FAILURE: Squawk A7600.

a. In case of RCF after departure, ACFT shall maintain last cleared and acknowledged level until passing DME 20 OL, then climb to the cruising level stated in the CPL. After completion of SID, proceed the most direct route to join the cleared ATS-route.

b. ACFT under radar vectoring shall, after setting the transponder to A7600, continue on heading last cleared and acknowledged for 2 minutes, then proceed the most direct route to join the cleared ATS-route.

(AFFSA/XOIA FIL 02/8.29)

(10) **OMAN**

(AD2.OOMS-10)

(a) SEEB INTL ARRIVALS

1. VMC, continue flight in VMC.
2. IMC:

a. At or above 9000', proceed direct to Seeb VOR-DME or NDB at last assigned level and comply with ICAO Procedures. If unable to land, climb in VOR-DME or NDB holding pattern and depart controlled airspace at applicable minimum enroute level and proceed to alternate.

b. Below 9000', climb immediately to the applicable minimum safe altitude, proceed direct to Seeb VOR-DME or NDB and comply with ICAO Procedures. If unable to land, climb in VOR-DME or NDB holding pattern and depart controlled airspace at applicable minimum enroute level and proceed to alternate. When on a heading to intercept Rwy 08/26 extended centerline and a failure is experienced or suspected, make the shortest turn to heading 020°, climb to 5000', proceed to Seeb VOR-DME or NDB and comply with ICAO Procedures. If unable to land, climb in VOR-DME or NDB holding pattern and depart controlled airspace at applicable minimum enroute level and proceed to alternate.

(b) SALALAH ARRIVALS

(AD2.OOSA-10)

1. VMC, continue flight in VMC.
2. IMC:

a. At or above 6000', proceed direct to Salalah VOR-DME or LOM at last assigned level and comply with ICAO Procedures. If unable to land, depart controlled airspace on heading 180°, climb to 6000', and proceed to alternate.

b. Below 6000', make the shortest turn to heading 180°, climb to 6000', proceed to Salalah VOR-DME or LOM and comply with ICAO Procedures. If unable to land, depart

EMERGENCY PROCEDURES A-23

controlled airspace on heading 180°, climb to 6000', and proceed to alternate.

(11) PHILIPPINES

(AIP SUP A005/01)

FOR NINYO AQUINO/MACTAN/SUBIC BAY INTL ARPT

The following lost communications procedure phraseology is standard in radar ATC clearance and shall not be given by the controller unless otherwise requested by the pilot concerned:

"IF NO TRANSMISSIONS ARE RECEIVED FOR ONE MINUTE MAKE A VISUAL APPROACH, IF UNABLE PROCEED TO THE VOR, MAINTAIN 4000 FEET OR LAST ASSIGNED ALTITUDE WHICHEVER IS HIGHER AND CONTACT THE TOWER IMMEDIATELY."

(12) SYRIA

(a) Action in case of radio communications failure (RCF) air ground failure. ATC shall maintain separation between the aircraft having the communication failure and other aircraft based on the assumption that the aircraft will operate in accordance with 1 or 2 of the following:

1. In case of Visual Meteorological Conditions (VMC) - Except as provided for in paragraph 2 hereafter, a controlled flight experiencing communication failure in VMC shall:

a. Set transponder to Code 7600.

b. Proceed to the planned destination at the last assigned altitude or the Minimum Enroute Altitude (MEA) whichever is higher.

c. Maintain the last assigned altitude or the MEA whichever is higher except where a change in altitude is required to maintain VMC.

d. If VMC conditions are encountered, maintain VMC and land at the nearest suitable VFR aerodrome.

e. Report its arrival time by the most expeditious means to the appropriate ATS unit.

2. Instrument Meteorological Conditions (IMC) - A controlled IFR flight experiencing communication failure in IMC, or where it does not appear feasible to continue in accordance with paragraph (a) above shall:

a. Set transponder to Code 7600

b. Maintain for a period of 5 minutes the last assigned speed and altitude or the MEA whichever is higher.

NOTE: The period of 5 minutes commences:

1. If operating on a route without compulsory reporting points or if instructions have been received to omit position reports:

A. At the time the last assigned level or MEA is reached, or

B. At the time the transponder is set to Code 7600 whichever is later, or

2. If operating on a route with compulsory reporting points and no omit position reports has been received:

A. At the time the last assigned level or MEA is reached, or

B. At the Previously reported pilot estimate for the compulsory reporting point, or

C. At the time of a failed report of position over a compulsory reporting point, whichever is later;

A-24 EMERGENCY PROCEDURES

NOTE: The period of 5 minutes is to allow the necessary air traffic control and coordination measures.

3. Thereafter, adjust level and speed in accordance with the filed flight plan.

NOTE: With regard to the route to be flown or the time to begin descent to arrival aerodrome, the current flight plan, which is the flight plan, including changes, if any, brought about by subsequent clearances, will be used.

4. Proceed according to the current flight plan route to the appropriate designated navigation aid serving the destination aerodrome and, when required to ensure compliance with Paragraph 2.e., hold over this aid until commencement of descent;

5. Commence descent from the navigation aid specified in paragraph 2.e. at, or as close as possible to, the expected approach time last received and acknowledged or, if no expected approach time has been received and acknowledged, at, or as close to as possible to, the estimate time of arrival resulting from the current flight plan;

6. Complete a normal instrument approach procedure (IAP) as specified for the designated navigation aid; and

7. Land, if possible, within thirty minutes after the estimated time of arrival specified in paragraph 2.e., or the last acknowledged expected approach time, whichever is later.

NOTE: With regard to departing controlled IFR flight IMC:

Departing controlled flight in IMC having acknowledged an initial or intermediate clearance to climb to a level other than the one specified in the current flight plan for the enroute phase of the flight, and experiencing two-way RCF should, if no time limit or geographical limit was included in the climb clearance, maintain for a period of three minutes, the level to which it was cleared and continue its flight in accordance with the current flight plan. The level specified in the current flight plan means the level contained in the enroute ATC clearance acknowledged by the pilot.

NOTE: Where the pilot in command (PIC) of an aircraft encounters conditions not covered by the above procedures, the PIC will be expected to use his or her best judgement in action to be taken.

(13) UNITED KINGDOM

(ENR 1-1-3-3; 1-1-3-6)

(a) IMC

1. Commence descent over holding point at last acknowledged EAT or ETA. Rate of descent in holding stack must not be less than 500 feet per minute. A descent may only be started within the 10 minutes following the EAT or ETA. When "Delay not determined" has been given and no subsequent EAT, do not attempt to land at destination airport, but proceed to another airport.

2. If unable to land within 30 minutes after EAT or ETA, leave vicinity of airport and associated controlled airspace by specified altitude and route. If none specified, fly at last assigned altitude or minimum sector altitude, whichever is higher, avoiding areas of dense traffic. Then either:

- a. Fly to an area where flight may be continued in VMC and land; or (if this is not possible)

- b. Select a suitable area to descend through clouds, fly visually to a suitable airport and land.

3. Communication failure occurs, after take-off in controlled airspace when ATC clearance includes the following:

- a. Request FL changes enroute:

EMERGENCY PROCEDURES A-25

- (1) Proceed as per clearance given climb to assigned FL in controlled airspace.
- (2) Turn left or right 60 and leave controlled airspace.
- (3) When clear of controlled airspace, climb to flight planned FL on a heading which will keep the aircraft clear of controlled airspace for a minimum period of 5 minutes, and which is compatible with rejoining controlled airspace when flight planned FL is reached.
- (4) When at flight planned FL, rejoin controlled airspace.

NOTE 1 - If aircraft is leaving the UK, the climb to flight planned level must be completed before crossing the UK FIR boundary.

NOTE 2 - If necessary to cross an airway during the climb, the crossing should be made at right angles to the airway at an intermediate 500 foot level.

b. CLIMB UNDER RADAR:

- (1) Proceed as per clearance given. Climb to assigned FL within controlled airspace.
- (2) After passing last reporting point at which a FL restriction is specified, climb to flight planned FL enroute within controlled airspace.
- (3) If no time limit or geographical limit was included in the climb clearance, operate secondary radar transponder on Mode A Code 7600 with Mode C, maintain the level to which the flight was cleared for a period of three minutes and then continue the flight in accordance with the current flight plan. If the flight has been vectored by RADAR away from the route specified in its current flight plan, the flight should continue in the most direct manner back to the route and then continue in accordance with the current flight plan.

6. HIJACKED AIRCRAFT

(ICAO DOC 4444 RAC/501/11)

- a. U.S. and ICAO ATC facilities recognize Mode 3/A, Code 7500, as meaning that the aircraft is being hijacked/forced to a new destination. Use Code 7500 to indicate a hijacking threat when under ATC radar control. When the situation precludes Code 7500 replies, the spoken words indicating such a squawk will receive similar ATC interpretation and action. Air traffic controllers will acknowledge and confirm receipt by asking the pilot if the code is intentionally being used. If the pilot replies in the affirmative or does not reply, the controller will not ask further questions but will flight follow, respond to pilot's requests, and notify appropriate authorities.
- b. The aircraft will be flight followed with normal hand-off procedures used. The receiving facility will be advised of the actions that have been taken to safeguard the hijacked aircraft, i.e., escort aircraft, search and rescue facilities, etc.
- c. If aircraft are dispatched to intercept and escort the hijacked aircraft, all possible assistance should be provided the intercepting aircraft to aid in placing it in a position behind the hijacked aircraft.

7. IN-FLIGHT TECHNICAL ASSISTANCE

(AFFSA/AFFSA)

- a. ANY U.S. MILITARY AIRCRAFT requiring in-flight technical assistance may use the communications and/or command and control facilities listed below.
- b. Air National Guard (ANG) Operations Center at Andrews AFB may be contacted by phone patch through any Global HF System Station. Request the ANG Operations Center (call sign MINUTEMAN) DSN 858-6001 or 1-800-237-9744.
- c. Air Mobility Command (AMC) Operations Centers may be contacted as described in Global HF System Stations, Section B.
- d. Air Combat Command (ACC) Command Posts may be contacted by calling "GOLDEN" on 381.3 MHz. A ACC Command Post will answer with its respective call sign. In addition, ACC Command Posts may be contacted by phone patch through any Global HF System Station or the

A-26 EMERGENCY PROCEDURES

Western Space and Missile Center (WSMC) HF net. The WSMC HF net (call sign ABNORMAL ONE ZERO located at Vandenberg AFB, CA or call sign ABNORMAL TWO ZERO located at Wheeler AFB, HI) may be contacted on USB frequencies 5700 and 13218 KHz. HQ ACC Command Post can be contacted on DSN 574-7771/2224.

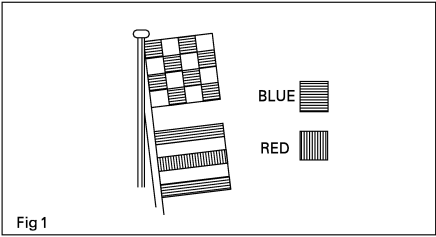
8. DISTRESS AND URGENCY SIGNALS - ICAO

(ICAO ANNEX 2)

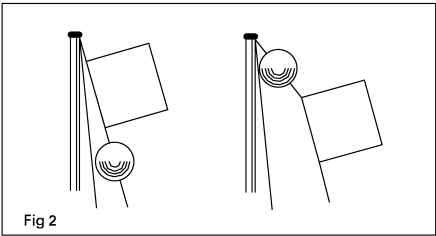
NOTE - None of the provisions in this section shall prevent the use, by an aircraft in distress, of any means at its disposal to attract attention, make known its position and obtain help.

a. **DISTRESS SIGNALS** - The following signals, used either together or separately, mean that grave and imminent danger threatens, and immediate assistance is requested:

- (1) A signal made by radiotelegraphy or by any other signaling method consisting of the group SOS in the Morse Code;
- (2) A signal sent by radiotelephony consisting of the spoken word MAYDAY;
- (3) Rockets or shells throwing red stars, fired one at a time at short intervals;
- (4) A rocket parachute flare or a hand flare showing a red light;
- (5) The two-flag signal corresponding to the letters NC of the international Code of Signals (Fig 1).



- (6) A signal consisting of a square flag having above it or below it a ball or anything resembling a ball (Fig 2).



- (7) A gun or other explosive signal fired at intervals of about 1 minute.
- (8) A continuous sounding with a fog-signaling apparatus.
- (9) Flames on a vessel (as from a burning tar barrel, oil barrel, etc.).
- (10) A smoke signal giving off a volume of orange-colored smoke.
- (11) Slowly and repeatedly raising and lowering arms outstretched to each side.

EMERGENCY PROCEDURES A-27

(12) Another well recognized National Distress signal is the displaying of the American Flag upside down.

(13) Flashes from a signal mirror.

NOTE - The radio telegraph alarm signal consists of a series of twelve dashes sent in 1 minute, the duration of each dash being 4 seconds, and the duration of the interval between 2 consecutive dashes being 1 second. (This may precede the distress signal SOS.)

NOTE - The radio-telephone alarm signal consists of 2 tones transmitted alternately over periods of from 30 seconds to 1 minute. (This may precede the distress call "MAYDAY").

b. URGENCY SIGNALS

(1) The following signals, used either together or separately, mean that an aircraft wishes to give notice of difficulties which compel it to land without requiring immediate assistance:

(a) The repeated switching on and off of the landing lights; or

(b) The repeated switching on and off of the navigation lights in such a manner as to be distinct from flashing navigation lights.

(2) The following signals, used either together or separately, mean that an aircraft has a very urgent message to transmit concerning the safety of a ship, aircraft or other vehicle, or of some person on board or within sight:

(a) A signal made by radiotelegraphy or by any other signaling method consisting of the group XXX;

(b) A signal sent by radiotelephony consisting of the spoken word PAN PAN.

A-28 EMERGENCY PROCEDURES

9. AIRCRAFT WITNESSING DISTRESS

(ICAO ANNEX 2)

a. When a pilot in command observes that another aircraft or a surface craft is in distress, pilot will, unless unable to do so, or in the circumstances of the case considers it unreasonable or unnecessary:

NOTE - Each ICAO contracting state shall ensure that wreckage resulting from aircraft accidents within its territory is removed, obliterated, or charted to prevent subsequent confusion.

(1) Keep distressed craft in sight until its presence is no longer necessary or no longer able to remain in the vicinity.

(2) If the position is not known with certainty, take such action as to determine it.

(3) Report to the rescue coordination center or air traffic services unit, as much of the following information as possible.

(a) Type of craft in distress, its identification and condition.

(b) Position in lat/long or distance/bearing from a landmark or NAVAID.

(c) Time of observation expressed in UTC on the 24 hour system.

(d) Number of persons observed.

(e) Whether persons have been seen to abandon distressed craft.

(f) Number of persons observed to be afloat.

(g) Apparent physical condition of survivors.

(4) Act as instructed by the rescue coordination center.

b. The pilot in command of the first aircraft to reach the place of the accident will, if unable to establish communication with the rescue coordination center or air traffic services unit, take charge of activities of all other aircraft to arrive until such time as by mutual agreement, responsibility is handed to that aircraft best able to provide communication under the prevailing circumstances.

c. Whenever a distress call and/or message is intercepted on the radiotelegraphy or radiotelephony by a pilot in command of an aircraft, other than a search aircraft, he will:

(1) Plot the position of the craft in distress, if given.

(2) If possible, take a bearing on the transmission.

(3) At the pilot's discretion, while awaiting instructions, proceed to the position given in the distress signal.

NOTE - In addition, compliance is required with communications procedures.

d. When it is necessary for an aircraft to direct a surface craft to the place where an aircraft or surface craft is in distress, the aircraft will do so by transmitting precise instructions by any means at its disposal. When this is not possible, the following procedure will be used:

(1) Circle the surface craft at least once.

(2) Cross the projected course of the surface craft close ahead, at a low altitude, opening and closing the throttle or changing the propeller pitch.

(3) Heading in the direction in which the surface craft is to be directed.

EMERGENCY PROCEDURES A-29

e. Crossing the wake of the surface craft, close astern, at a low altitude, opening and closing the throttle or changing the propeller pitch means that the assistance of the surface craft to which the signal is directed is no longer required.

f. Current maritime signaling procedures include:

(1) For acknowledgment of receipt of signal:

(a) Hoisting of the "Code Pennant" (vertical red and white stripes) close up, (meaning understood).

(b) The flashing of a succession of "T's" by signal lamp in Morse code.

(c) The changing of heading.

(2) For indicating the inability to comply:

(a) Hoisting of the international flag "N" (a blue and white checkered square).

(b) The flashing of a succession of "N's" in the Morse code.)

g. Upon receiving a signal from an Emergency Position Indicating Radio Beacon (EPIRB)/ Emergency Locating Transmitter (ELT) on 121.5 or 243.0 MHz, report the following information:

(1) Position/bearing and time first heard.

(2) Position/bearing and time last heard.

(3) Position/bearing at maximum signal strength.

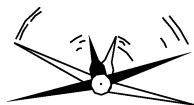
(4) Flight level/frequency.

10. AIR/GROUND EMERGENCY PROCEDURES

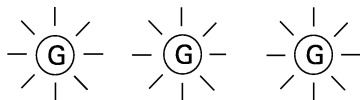
(ICAO DOC 7333)

a. STANDARD AIRCRAFT ACKNOWLEDGMENTS

MESSAGE RECEIVED AND UNDERSTOOD:
Aircraft will indicate that ground signals have been seen and understood by -



DAY OR MOONLIGHT: Rocking from side to side.

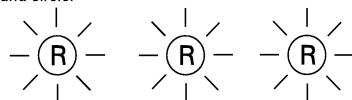


NIGHT: Making green flashes with signal lamp.

MESSAGE RECEIVED AND NOT UNDERSTOOD:
Aircraft will indicate that ground signals have been seen but not understood by -



DAY OR MOONLIGHT: Making a complete right hand circle.



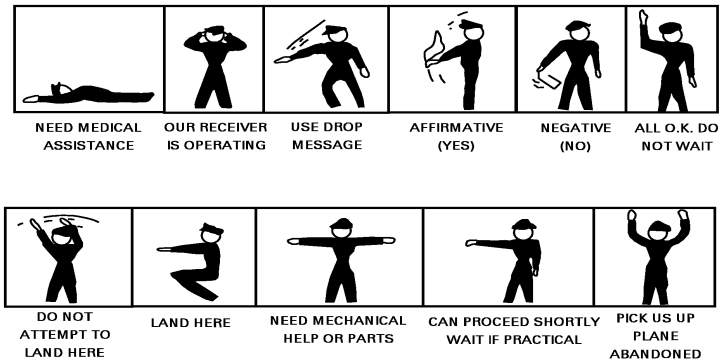
NIGHT: Making red flashes with signal lamp.

b. BODY SIGNALS

INSTRUCTIONS: If you are able to attract the attention of the pilot of a rescue airplane, the body signals illustrated below can be used to transmit messages to him as he circles over your location. Stand in the open when you make the signals. Be sure that the background, as seen from

A-30 EMERGENCY PROCEDURES

the air, is not confusing. Go through the motions slowly and repeat each signal until you are positive that the pilot understands you.



c. INTERNATIONAL GROUND/AIR EMERGENCY CODE

(1) INSTRUCTIONS

- (a) Lay out symbols by using strips of fabric or parachutes, pieces of wood, stones, or any available material.
- (b) Provide as much color contrast as possible between material used for symbols and background against which symbols are exposed.
- (c) Symbols should be at least 8 feet high or larger. Care should be taken to lay out symbols exactly as shown.
- (d) In addition to using symbols, every effort is to be made to attract attention by means of radio, flares, smoke, or other available means.
- (e) On snow covered ground, signals can be made by dragging, shoveling or tramping. Depressed areas forming symbols will appear black from the air.
- (f) Pilot should acknowledge message by using signals described in paragraph 8.a.

DISTRESS SIGNALS.

d. GROUND/AIR VISUAL CODE FOR USE BY SURVIVORS
(ICAO ANNEX 12, ICAO DOC 7333)





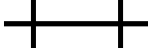


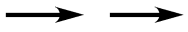

IF IN DOUBT, USE INTERNATIONAL SYMBOL..... **SOS**

Direction of your aircraft approach may cause difficulty in proper recognition.
Draw signal as you see it to fit the symbols as outlined here.

EMERGENCY PROCEDURES A-31

e. GROUND/AIR VISUAL CODE FOR USE BY SEARCH PARTIES





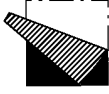











(ICAO ANNEX 12, ICAO DOC 7333)

			
OPERATION COMPLETED	WE HAVE FOUND ALL PERSONNEL	WE HAVE FOUND ONLY SOME PERSONNEL	WE ARE NOT ABLE TO CONTINUE RETURNING TO BASE
			
HAVE DIVIDED IN TWO GROUPS, EACH PROCEEDING IN DIRECTION INDICATED	INFORMATION RECEIVED THAT AIRCRAFT IS IN THIS DIRECTION	NOTHING FOUND WILL CONTINUE SEARCH	

f. PAULIN SYMBOLS

(ICAO DOC 7333)

INSTRUCTIONS: Either USAF or USN paulins may be used to form signals. The paulins are blue on one side and yellow or red on the other. They are held down in wind with rocks, stones, or pegs. In life rafts, lines are tied to grommets to facilitate holding. Wood may be tied to edge and floated in center of small lakes or slow rivers.

				
LAND & SEA: O.K. TO LAND ARROW SHOWS LANDING DIRECTION	LAND & SEA: DO NOT ATTEMPT LANDING	ON LAND: WALKING IN THIS DIRECTION AT SEA: DRIFTING	ON LAND: NEED GAS AND OIL PLANE IS FLYABLE	LAND & SEA: PLANE IS FLYABLE NEED TOOLS
				
LAND & SEA: NEED MEDICAL ATTENTION	LAND & SEA: NEED FIRST AID SUPPLIES	ON LAND: NEED QUININE OR ATABRINE AT SEA: NEED SUN COVER	AT SEA: NEED EQUIPMENT AS INDICATED SIGNALS FOLLOW	LAND & SEA: NEED FOOD AND WATER
				YELLOW OR RED
ON LAND: NEED WARM CLOTHING AT SEA: EXPOSURE SUIT OR CLOTHING INDICATED	ON LAND: SHOULD WE WAIT FOR RESCUE PLANE AT SEA: NOTIFY RESCUE AGENCY OF MY POSITION	ON LAND: INDICATE DIRECTION OF NEAREST CIVILIZATION AT SEA: INDICATE DIRECTION OF RESCUE AIRCRAFT		BLUE
				PANEL SIGNALS SURVIVORS USE LIFERAFT SAILS TO CONVEY SIGNALS

NOTE - (1) It is preferable to use the International Ground Air Emergency Code. The symbols can be made larger and hence more recognizable from the air.

(2) Paulins should be folded to form the signals shown on this page. A paulin is an extremely valuable shelter, poncho, floor cloth, sleeping bag cover, sunshade, or rain collector.

A-32 EMERGENCY PROCEDURES

11. INTERCEPTION SIGNALS

INTERCEPTION SIGNALS

COUNTRY EXCEPTIONS TO ICAO STANDARD ARE LISTED BELOW
(ICAO STANDARD IS ON BACK COVER OF FIH)

INTERCEPTION SIGNALS - ALGERIA

(AIP RAC 5-3.02)

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	DAY - Rocking wings while passing intercepted aircraft.	(Switch on frequency 119.7 in order to receive my instructions. (In certain cases these instructions will be retransmitted by an Air/ Ground Station).	DAY - Rocking wings.	I will execute your signal.
	NIGHT - Series of flashing lights by any means available while passing intercepted aircraft.	Switch on frequency 119.7 in order to receive my instructions. (In certain cases these instructions will be retransmitted by an Air/ Ground Station).	NIGHT - Series of flashing lights by any means available.	I will execute your signal.
	DAY - Rocking wings from a position in front and to the left, if interceptor intends only to lead aircraft away from a certain area. Once signal acknowledged, initiate a level turn on to the desired course.	Follow me.	DAY - Rocking wing and following.	Understood and will follow you.
	DAY - Rocking wing from a position in front and to the right, if interceptor intends to lead aircraft for a landing. Once signal acknowledged, initiate a level turn on the desired course.	Follow me.	DAY - Rocking wings and following.	Understood and will follow you.

EMERGENCY PROCEDURES A-33

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
	NIGHT - The same as above except adding series of flashing lights by any means available.	Follow me.	NIGHT - Series of flashing lights by any means available.	Understood and will follow you.
2	An abrupt break away of 90 degrees or more.	You may proceed.	DAY or NIGHT - Rocking wings.	Understood.
3	DAY - Circling of airport and lowering of landing gear.	Land at this airport.	Same as interceptor and proceed to land.	Understood.
	NIGHT - The same plus turning on the landing lights.	Land at this airport.	Same as interceptor and proceed to land.	Understood.
4	DAY - Rocking wings while passing over landing runway at an altitude exceeding 1000 feet above the level of the airport.	Airport you have designated is inadequate.	DAY or NIGHT - If it is desired that other aircraft follow him to an alternate airport, the interceptor signals the first series.	Follow me.
	NIGHT - Flashing landing lights while passing over landing runway at an altitude not exceeding 1000 feet above the level of the airport. If unable to flash landing lights, any light available.	Airport you have designated is inadequate.		
DISTRESS INTERCEPTION SIGNALS				
	DAY - Porpoising.	In distress.	DAY or NIGHT - Same as Fourth Series.	
	NIGHT - Switch on landing lights and hold steady beam.	In distress.	Same as Fourth Series.	

A-34 EMERGENCY PROCEDURES

INTERCEPTION SIGNALS - CUBA

(AIP RAC 8-1)

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	<p>DAY - Rocking wings from a position in front and, normally, to the left of intercepted aircraft and, after acknowledgment, a slow level turn, normally to the left, on to the desired heading.</p> <p>NIGHT - Same and, in addition, flashing navigational lights at irregular intervals.</p> <p>Note 1. - Meteorological conditions or terrain may require the intercepting aircraft to take up a position in front and to the right of the intercepted aircraft and to make the subsequent turn to the right.</p> <p>Note 2. - If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of race-track patterns and to rock its wings each time it passes the intercepted aircraft.</p>	<p>You have been intercepted. Follow me.</p>	<p>AIRPLANES: DAY - Rocking wings and following.</p> <p>NIGHT - Same and, in addition, flashing navigational lights at irregular intervals.</p> <p>HELICOPTERS: DAY or NIGHT - Rocking aircraft, flashing navigational lights at irregular intervals and following.</p> <p>NOTE - Additional action required to be taken by intercepted aircraft is prescribed in "ACTION BY INTERCEPTED AIRCRAFT."</p>	<p>Understood, will comply.</p>
2	<p>DAY or NIGHT - An abrupt breakaway from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without crossing the line of flight of the intercepted aircraft.</p>	<p>You may proceed.</p>	<p>AIRPLANES: DAY or NIGHT - Rocking wings.</p> <p>HELICOPTERS: DAY or NIGHT - Rocking aircraft.</p>	<p>Understood, will comply.</p>

EMERGENCY PROCEDURES A-35

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
3	DAY - Circling airport, lowering landing gear and overflying runway in direction of landing or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area. NIGHT - Same and, in addition, showing steady landing lights.	Land at this airport.	AIRPLANES: DAY - Lowering landing gear, following the intercepting aircraft and, if after overflying the runway landing is considered safe, proceeding to land. NIGHT - Same and, in addition, showing steady landing lights (if carried). HELICOPTERS: DAY or NIGHT - Following the intercepting aircraft and proceeding to land, showing a steady landing light (if carried).	Understood, will comply.
4	AIRPLANES: DAY - Raising landing gear while passing over landing runway at a height exceeding 300 m (1000 ft) but not exceeding 600 m (2000 ft) above the airport level, and continuing to circle the airport. NIGHT - Flashing landing lights while passing over landing runway at a height exceeding 300 m (1000 ft) but not exceeding 600 m (2000 ft) above the airport level, and continuing to circle the airport. If unable to flash landing lights, flash any other lights available.	Airport you have designated is inadequate.	DAY or NIGHT - If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate airport, the intercepting aircraft raises its landing gear and uses the Series 1 signals prescribed for intercepting aircraft. If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood, follow me. Understood, you may proceed.

A-36 EMERGENCY PROCEDURES

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
5	AIRPLANES: DAY or NIGHT - Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT - Use Series 2 signals prescribed for intercepting aircraft.	Understood.
6	AIRPLANES: DAY or NIGHT - Irregular flashing of all available lights. HELICOPTERS: DAY or NIGHT - Irregular flashing of all available lights.	In distress.	DAY or NIGHT - Use Series 2 signals prescribed for intercepting aircraft.	Understood.

EMERGENCY PROCEDURES A-37

INTERCEPTION SIGNALS - LEBANON AND MALTA

(LE AIP RAC 1 APP-1) (MT AIP RAC 28)

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	DAY - Rocking wings from a position in front and to the left, if interceptor intends only to lead aircraft away from a certain area. Once signal acknowledged, initiate a level turn on to the desired course.	Follow me.	DAY or NIGHT - Rocking wings and following.	Understood and will follow you.
	DAY - Rocking wings from a position in front and to the right, if interceptor intends to lead aircraft for a landing. Once signal acknowledged, initiate a level turn to the desired course.	Follow me.	DAY or NIGHT - Rocking wings and following.	Understood and will follow you.
	NIGHT - The same except adding series of flashing lights at irregular intervals by any means available.	Follow me.	DAY or NIGHT - Rocking wings and following.	Understood and will follow you.
2	An abrupt break away upward of 90 degrees or more.	You may proceed.	DAY or NIGHT - Rocking wings.	Understood.
3	Circle airport and lower landing gear.	Land at this airport.	Same as interceptor and proceed to land.	Understood.
		SAME	SAME	SAME
	NIGHT (For LEBANON and MALTA only.) - The same except showing Steady landing lights (if carried).	SAME	SAME	SAME
4	DAY - Rocking wings while passing over landing runway at an altitude exceeding 1000 feet above the level of the airport.	Airport you have designated is inadequate.	DAY or NIGHT - If it is desired that other aircraft follow him to an alternate airport, the interceptor signals the first series.	Follow me.

A-38 EMERGENCY PROCEDURES

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
	NIGHT - Flashing landing lights while passing over landing runway at an altitude not exceeding 1000 feet above the level of the airport. If unable to flash landing lights, any light available.	Airport you have designated is inadequate.	Should the interceptor decide to release intercepted aircraft, he signals the second series.	You may proceed.
	DAY - (For MALTA only) - Rocking wings while passing over landing runway at an altitude not exceeding 1000 feet above the level of the airport.	Airport you have designated is inadequate.		
DISTRESS INTERCEPTION SIGNALS				
	DAY - Porpoising.	In distress.	DAY OR NIGHT - Same as Fourth Series.	
	NIGHT - Switch on landing lights and hold steady beam.	In distress.	Same as Fourth Series.	

INTERCEPTION SIGNALS -

REPUBLIC OF SOUTH AFRICA

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	DAY - Rocking wings while in front and to left of intercepted aircraft, and after acknowledgment a slow level turn on to desired course.	Follow me away from a prohibited area.	Rocking wings.	Understood, will comply.
	DAY - Rocking wings while in front and to right of intercepted aircraft, and after acknowledgment a slow level turn on to a desired course.	Follow me to a landing area.	Rocking wings.	Understood, will comply.
	NIGHT - As for day and in addition flashing navigational and, if available, landing lights at irregular intervals.		Rocking wings and showing steady landing light.	
2	DAY or NIGHT - An abrupt break away upwards of 90° or more without crossing the line of flight of the intercepted aircraft.	You may proceed.	Rocking wings if considered safe, at night showing steady landing light.	Understood, will comply.
3	DAY - Circling landing area, lowering landing gear and overflying the direction of landing.	Land on this landing area.	Same as interceptor and proceed to land if considered safe, at night showing steady landing light.	Understood, will comply.
	NIGHT - As for day and showing steady landing light.			
4	DAY - Rocking wings (if fixed landing gear) or raising landing gear while passing over landing area at a height feet between 1000 feet and 2000.	Landing area unsuitable.	First or second series dependent on intercepting aircraft intent.	Understood, will comply.

A-40 EMERGENCY PROCEDURES

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
	NIGHT - Flashing light or any other light available while passing over landing area at a height between 1000 feet and 2000 feet and continue circling landing area.			

INTERCEPTION SIGNALS - RUSSIA

(AIP RAC 8-1)

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	<p>DAY - Rocking wings from a position slightly above and ahead of, and normally to the left of the intercepted aircraft and, after acknowledgment, a slow level turn, normally to the left, on to the desired heading.</p> <p>NIGHT - Same actions as by day and, in addition, flashing navigational and landing (if carried) lights at irregular intervals.</p> <p>NOTE 1 - Meteorological conditions or terrain may require the intercepting aircraft to take up a position slightly above and ahead of, and to the right of the intercepted aircraft and to make the subsequent turn to the right.</p> <p>NOTE 2 - If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of race-track patterns (two 180 turns) and to rock its wings each time it passes the intercepted aircraft.</p>	<p>You have been intercepted. Follow me.</p>	<p>AIRPLANES: DAY - Rocking wings and following the intercepting aircraft.</p> <p>NIGHT - Same actions as by day and, in addition, flashing navigational and landing (if carried) lights at irregular intervals.</p> <p>HELICOPTERS: DAY OR NIGHT - Rocking aircraft, flashing navigational and landing lights at irregular intervals and following the intercepting aircraft.</p>	<p>Understood, will comply.</p>

A-42 EMERGENCY PROCEDURES

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
2	DAY OR NIGHT - An abrupt break-away maneuver from the intercepted aircraft consisting of a climbing turn of 90 or more without crossing the line of flight of the intercepted aircraft.	You may proceed.	AIRPLANES: DAY OR NIGHT - Rocking wings. HELICOPTERS: DAY OR NIGHT - Rocking aircraft.	Understood, will comply.
3	DAY - Circling airport, lowering landing gear and overflying runway in direction of landing or, if the intercepted aircraft is a helicopter, overflying the airport (the helicopter landing area). NIGHT - Same as in the daytime and, in addition, showing steady landing lights.	Land at this airport.	AIRPLANES: DAY - Lowering landing gear, following the intercepting aircraft and, if after overflying the runway landing is considered safe, proceeding to land. NIGHT - Same as in the daytime and, in addition, showing steady landing lights. HELICOPTERS: DAY OR NIGHT - Following the intercepting aircraft and proceeding to land, showing steady landing lights.	Understood, will comply.
4	AIRPLANES: DAY - Retracting the undercarriage over the runway at a height exceeding 300 m but not exceeding 600 m above the airport level and continuing to circle the airport.	The airport you have designated does not correspond to the type of an aircraft and is inadequate for landing.	AIRPLANES: DAY OR NIGHT - If it is required that the intercepted aircraft should follow the intercepting aircraft to an alternate airport, the intercepting aircraft retracts the undercarriage and uses the Series 1 signals prescribed for intercepting aircraft.	Understood, follow me.

EMERGENCY PROCEDURES A-43

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
	<p>NIGHT - Flashing landing lights while passing over the runway at a height exceeding 300 m but not exceeding 600 m above the airport level, and continuing to circle the airport. If unable to flash landing lights, flash any other lights available.</p>			
	<p>HELICOPTERS: DAY - Passing over the airport (the helicopter landing area) at a height exceeding 50 m but not exceeding 100 m above the airport level (helicopter landing area level) and continuing to circle.</p>	<p>The airport you have designated does not correspond to the type of an aircraft and is inadequate for landing.</p>	<p>HELICOPTERS: DAY OR NIGHT - If it is required that the intercepted aircraft should follow the intercepting aircraft to an alternate airport (helicopter landing area), the intercepting aircraft uses the Series 1 signals prescribed for intercepting aircraft.</p>	<p>Understood, follow me.</p>
	<p>NIGHT - Flashing landing and navigational lights while passing over the airport (helicopter landing area) at a height exceeding 50 m but not exceeding 100 m above the airport (helicopter landing area) level and continuing to circle.</p>		<p>AIRPLANES AND HELICOPTERS: DAY OR NIGHT - If it is decided to let the intercepted aircraft proceed, the intercepting aircraft uses the Series 2 signals for intercepting aircraft.</p>	<p>Understood, you may proceed.</p>
5	<p>DAY OR NIGHT - Regular switching on and off of all running lights but in such a manner to be distinct from flashing lights.</p>	<p>Cannot comply.</p>	<p>DAY OR NIGHT - Use Series 2 signals prescribed for intercepting aircraft.</p>	<p>Understood.</p>
6	<p>DAY OR NIGHT - Irregular flashing of all available lights.</p>	<p>In distress.</p>	<p>DAY OR NIGHT - Use Series 2 signals prescribed for intercepting aircraft.</p>	<p>Understood.</p>

A-44 EMERGENCY PROCEDURES

INTERCEPTION SIGNALS - SWEDEN

(AIP RAC 8-1)

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	<p>DAY - Rocking wings three times from a position in front and, normally, to the left of intercepted aircraft and, after acknowledgment, a slow turn, normally to the left, on to the desired heading.</p> <p>NIGHT - Same and, in addition, flashing navigational lights at irregular intervals.</p> <p>If not acknowledged: DAY - Rocking wings several times (10-20).</p> <p>NIGHT - Same and, in addition, flashing navigational lights at irregular intervals during an extended period.</p> <p>NOTE 1 - Meteorological conditions or terrain may require the intercepting aircraft to take up a position in front and to the right of the intercepted aircraft and to make the subsequent turn to the right.</p>	<p>Caution! You have been intercepted. Follow me.</p> <p>Follow my instructions, otherwise your safety cannot be guaranteed.</p>	<p>AIRPLANES: DAY - Rocking wings and following.</p> <p>NIGHT - Same and, in addition, flashing navigational lights at irregular intervals.</p> <p>HELICOPTERS: DAY or NIGHT - Rocking aircraft, flashing navigational lights at irregular intervals and following.</p> <p>NOTE: Additional action required to be taken by intercepted aircraft is prescribed in para 4.</p>	<p>Understood. Will comply.</p>

EMERGENCY PROCEDURES A-45

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
	NOTE 2 - If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of the race-track patterns and to rock its wings each time it passes the intercepted aircraft.			
2	DAY or NIGHT - An abrupt breakaway maneuver from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without crossing the line of flight of the intercepted aircraft.	You may proceed.	AIRPLANES: DAY or NIGHT Rocking wings. HELICOPTERS: DAY or NIGHT Rocking aircraft.	Understood. Will comply.
3	DAY - Circling airport, lowering landing gear and overflying runway in direction of landing or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area. NIGHT - Same and, in addition, showing steady landing lights.	Land at this airport.	AIRPLANES: DAY - Lowering landing gear, following the intercepting aircraft and, if after overflying the runway landing is considered safe, proceeding to land. NIGHT - Same and, in addition, showing steady landing lights (if carried). HELICOPTERS: DAY or NIGHT - Following the intercepting aircraft and proceeding to land, showing a steady landing light (if carried).	Understood. Will comply.

Signals initiated by intercepted aircraft and responses by intercepting aircraft.

A-46 EMERGENCY PROCEDURES

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
4	AIRPLANES: DAY - Raising landing gear while passing over landing runway at a height exceeding 1000 ft (300 m) but not exceeding 2000 ft (600 m) above the airport level, and continuing to circle the airport.	Airport you have designated is inadequate.	DAY or NIGHT - If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate airport, the intercepting aircraft raises its landing gear and uses the Series 1 signals prescribed for intercepting aircraft.	Understood. Follow me.
	NIGHT - Flashing landing lights while passing over landing runway at a height exceeding 1000 ft (300 m) but not exceeding 2000 ft (600m) above the airport level, and continuing to circle the airport. If unable to flash landing lights, flash any other lights available.		If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood. You may proceed.
5	AIRPLANES: DAY or NIGHT - Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT - Use Series 2 signals prescribed for intercepting aircraft.	Understood.
6	AIRPLANES: DAY or NIGHT - Irregular flashing of all available lights.	In distress.	DAY or NIGHT - Use Series 2 signals prescribed for intercepting aircraft.	Understood.
	HELICOPTERS: DAY or NIGHT - Irregular flashing of all available lights.			

INTERCEPTION SIGNALS - TAIWAN

(AIP ENR1.12)

1. If interception by CAF aircraft is imminent, the intercepted aircraft will:
 - a. Respond to visual signals from interception aircraft, and do not perform any maneuvers which maybe construed as hostile; fly straight and level.
 - b. Notify, if possible, appropriate air traffic services unit.
 - c. Attempt to establish communications with interceptor aircraft or appropriate intercept control unit on 243.0 MHz, 121.5 MHz.
 - d. Unless otherwise instructed by the appropriate air traffic service unit, set transponder code on 7700.
 - e. Safety of aircraft under interception will not be secure if they fail to obey any instruction given by the interceptor.
 - f. Taiwan will not be responsible for any damage caused to aircraft by the interceptors or other devices due to non-compliance with the Air Defense Identification or Air Traffic Control Regulations and Procedures.

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	<p>DAY - Rocking wings three times from a position in front and to the left (or right) of the intercepted aircraft.</p> <p>NIGHT - As day with the addition of flashing navigation lights three times.</p>	Use caution you are violating this nation's airspace.	<p>DAY - Rocking wings.</p> <p>NIGHT - Same as day with the addition of flashing navigation lights.</p>	Roger, wings.
2	<p>DAY - The interceptor intends to lead intercepted aircraft away from an area or to an intended airport. The interceptor will rock his wings several times from a position in front of intercepted aircraft and after acknowledgment a slow level turn on to the desired course.</p> <p>NIGHT - Same as day with the addition of a series of flashing lights at irregular intervals by any means available.</p>	Follow me.	DAY or NIGHT - Rocking wings and following.	Roger, wilco.
3	An abrupt break away upwards of 90 degrees or more.	You may proceed.	DAY or NIGHT - Rocking wings and following.	Roger, wilco.

A-48 EMERGENCY PROCEDURES

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
4	Circling airport and lowering landing gear.	Land at this airport.	<p>Following the interceptor lowering landing gear and proceed to land.</p> <p>DAY - Rocking wings while passing over landing runway at a height exceeding 1,000 feet above the level of the airport.</p> <p>NIGHT - Same as day with the addition of flashing landing lights, if unable to flash landing lights flash any lights available.</p>	<p>Roger, wilco.</p> <p>Airport that you have designated is inadequate.</p>
5	If it is desired that the intercepted aircraft follow the interceptor or other aircraft to an alternative airport, the interceptor use the series 2 signals.	Follow me.	Rocking wings and following.	Roger, wilco.
6	<p>DAY - Pull up and down several times from a position abreast the intercepted aircraft.</p> <p>NIGHT - Same as day with the addition of flashing navigation lights several times.</p>	If you do not obey our instructions your safety will not be secured.	<p>DAY - Rocking wings.</p> <p>NIGHT - Same as day with the addition of flashing navigation lights.</p>	Roger, wilco.

INTERCEPTION SIGNALS - SERBIA

(AIP RAC 1)

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	DAY - Approach (at least to 100 meters) to the left side in the direction and at level of the intercepted aircraft and multiple wing wags.	Follow me.	DAY - Mild rocking of wings to each side.	Understood and will follow you.
	NIGHT - The same as during day adding multiple switch on and off navigation lights.	Follow me.	NIGHT - Multiple switch on and off navigation lights.	Understood and will follow you.
2	DAY or NIGHT - An abrupt break away of 90 degrees or more from the direction of the flight.	You may proceed.	DAY - Mild rocking of wings to each side.	Understood.
			NIGHT - Multiple switch on and off navigation lights.	
3	DAY - Circling of airport and lowering of landing gear.	Land at this airport.	Same as interceptor and proceed to land.	Understood and will land.
	NIGHT - Circling of airport and switch on landing lights.	Land at this airport.	Same as interceptor and proceed to land.	Understood and will land.
4	DAY - Approach (at least to 100 meters) to the left side in the direction and at the level of the intercepted aircraft and two short bursts fired.	Follow me this is the last warning; your safety is not guaranteed.	DAY - Mild rocking of wings to each side.	Understood and will follow you.
	NIGHT - The same as during day adding multiple switch on and off navigation lights.	Follow me this is the last warning; your safety is not guaranteed.	NIGHT - Multiple switch on and off navigation lights.	Understood and will follow you.

NOTE - Interceptor aircraft signal under series number 1 has to be used before the interceptor uses the procedure under series number 4.

A-50 EMERGENCY PROCEDURES

12. PROCEDURES FOR THE PREVENTION OF DANGEROUS MILITARY ACTIVITIES BETWEEN THE US AND RUSSIA -

(JCS J-S/AFFSA)

a. An agreement between the United States and Russia seeks to ensure the safety of the personnel and equipment of each country's armed forces by avoiding certain dangerous military activities and expeditiously and peacefully resolving related incidents.

b. When in the proximity to one another, the armed forces of each country are to refrain from:

- (1) dangerous use of lasers.
- (2) dangerous interference with command and control systems.
- (3) certain activities in mutually agreed upon Special Caution Areas.

c. The US and Russia have also agreed to follow special procedures when the armed forces of one country enters, either unintentionally or as a result of force majeure, into the national territory of the other country.

d. See CJCS Instruction 2311.01, 3 Aug 94, "Implementation Procedures for the Agreement Between the United States and Russia on the Prevention of Dangerous Military Activities," for more information on the Agreement. The following paragraphs e. through i. describe specific procedures to be used under this agreement.

e. COMMUNICATIONS - The following frequencies will be used to establish radio communications.

(1) between US and Russian aircraft, or between an aircraft and air traffic control or monitoring facility of the two armed forces, on 243.0 MHz (International Distress and Emergency frequency) or 121.5 MHz (International Aeronautical Emergency frequency), or on HF band frequency 4125.0 kHz AM (alternate 6215.5 kHz AM), both agreed International Distress and Safety Calling/Reply frequencies for contact beyond line of sight. After the phrase "Radio Contact" is exchanged, use frequencies 278.0 MHz, 130.0 MHz, or 4125 kHz, respectively, for sustained radio communications.

(2) between a US or Russian ship and an aircraft of the opposite force: on 243.0 MHz (International Distress and Emergency frequency) or 121.5 MHz (International Aeronautical Emergency frequency). After initial contact is made and the parties agree, they will move to 278.0 MHz or 130.0 MHz respectively when sustained communications are required.

NOTE: The sustained radio communications frequencies are not dedicated to Dangerous Military Activities. At times, these frequencies may be unusable.

(3) Although the frequencies above are intended for communications involving aircraft, attempts to contact Russian Forces can be made, should the capability exist, using the frequencies designed for ship or ground communications, as appropriate.

(a) Ship-to-Ship and Ship-to-Shore Communications: VHF band (Channel 16) frequency 156.8 MHz FM (International Distress and Calling frequency), or on HF band frequency 2182.0 kHz AM (International HF Distress and Calling frequency).

(b) Ground Communications: VHF band frequency 44.0 MHz FM (alternate 46.5 MHz FM), or on HF band frequency 4125.0 kHz USB (alternate 6215.5 USB) (International HF Distress and Calling frequencies).

EMERGENCY PROCEDURES A-51

COMMUNICATIONS FREQUENCIES

OPERATION	PRIMARY INITIAL CONTACT	ALTERNATE ^① FREQUENCIES	SUSTAINED COMMUNICATIONS
<u>AIR-RELATED</u>			
VHF	121.5 MHz		130.0 MHz
UHF	243.0 MHz		278.0 MHz
HF (AM)	4125.0 kHz	6215.5 kHz	4125.0 kHz
<u>SEA-RELATED</u>			
VHF	156.8 MHz		156.8 MHz
HF (AM)	2182.0 kHz		2182.0 kHz
<u>GROUND-RELATED</u>			
VHF	44.0 MHz	46.5 MHz ^②	44.0 MHz ^②
HF (USB)	4125.0 kHz	6215.5 kHz	4125.0 kHz

①Contact will be initiated on the primary frequency. If contact cannot be made, personnel will attempt contact on the alternate frequency (where available). The sustained communications frequency will be used when extended communications are required and after the phrase "Radio Contact" is exchanged.

②Radio equipment to be set in the "Old" squelch position.

f. RADIO CALL SIGNS - For expeditious identification of an aircraft, ship ground control station, or ground unit, the call signs below will be used:

RADIO CALL SIGNS

<u>Platform</u>	<u>Russian</u>	<u>Call Sign</u>
Ship	"Bugel" (phonetic - BOO-gel)	"Port Mast"
Aircraft	"Sedlo" (phonetic - Sed-LOW)	"Ivory Eagle"
Air Traffic Control or Monitoring Facility	"Zemlya" (phonetic - Zem-le-YAW)	"Electric Light"
Ground Force or Unit	"Polya" (phonetic - POLE-yaw)	"Post Pounder"

g. RADIO PROCEDURES -

(1) Communications procedures for initial contact will use full, not abbreviated, radio telephone procedures, bearing in mind that the Russian operator who will be initiating the call or responding may not speak or fully understand English. To initiate radio contact, the following procedure should be used.

(a) The aircraft, ship air traffic control or monitoring facility, or ground unit initiating contact will transmit the call sign of the party to be contacted three times, followed by the words, "Delta Echo" (meaning "from" in the context of these procedures), and then followed by the caller's call sign one time. The word "Over" is optional at the end of each transmission.

A-52 EMERGENCY PROCEDURES

(b) To respond to an initial radio contact, the aircraft, ship, air traffic control or monitoring facility, or ground unit being called will transmit the call sign of the party that has attempted to contact it three times, followed by the words, "Delta Echo" (meaning "from" in the context of these procedures), then followed by the respondent's call sign one time. The word "Over" is optional at the end of each transmission. Example:

INITIAL RADIO CONTACT:

SEDLO SEDLO SEDLO. DELTA ECHO. IVORY EAGLE. (OVER)

RESPONSE:

IVORY EAGLE IVORY EAGLE IVORY EAGLE. DELTA ECHO. SEDLO. (OVER)

(2) The procedures for switching to a frequency for sustained communications are as follows:

(a) the aircraft, ship, air traffic control or monitoring facility, or ground unit initiating contact will transmit the call sign of the party to be contacted (after the initial call, the call signs will be stated only once), followed by the words "Delta Echo," then followed by the caller's call sign and the words "Radio Contact," and

(b) the aircraft, ship, air traffic control, or monitoring facility being contacted will transmit the call sign of the party first initiating contact, followed by the words "Delta Echo," then followed by the respondent's call sign and the words "Radio Contact." The word "Over" is optional at the end of each transmission. Example:

SWITCHING FREQUENCIES FOR SUSTAINED COMMUNICATIONS:

SEDLO. DELTA ECHO. IVORY EAGLE. RADIO CONTACT. (OVER)

RESPONSE:

IVORY EAGLE. DELTA ECHO. SEDLO. RADIO CONTACT. (OVER)

h. SIGNALS and PHRASES - Both US and Russian armed forces recognize that the lack of communication can increase the danger to their personnel and equipment and create international incidents. Therefore, US aircrews will ensure that the guard channel (frequency 243.0 MHz or 121.5 MHz) is operational and monitored, especially whenever aircraft of the two forces are in visual contact. However, language barriers or equipment malfunctions may make radio communications impossible. Therefore, United States and Russia have agreed to a list of English phrases and visual signals that can be used to convey essential information and acknowledge instructions. If the exchange of information is necessary, but communication in English is not possible, attempts should be made to communicate by using these prearranged phrases contained in Table I. In addition, Table II contains useful English phrases that can be used. If radio communications cannot be established or understood, attempt to communicate using the visual signals contained in Table I. Aircraft-to-aircraft communications can also be conducted using visual signals for intercepting and intercepted aircraft contained in the FIH (see page , INTERCEPTION SIGNALS - RUSSIA). In addition, US personnel will attempt to communicate with their higher headquarters or their operational command, which in turn will attempt to communicate with its Russian counterpart to resolve the incident through the communications channels set forth in this agreement.

EMERGENCY PROCEDURES A-53

TABLE 1
ADDITIONAL SIGNALS, PHRASES AND APPROPRIATE RESPONSES

MEANING OF SIGNAL PHRASE	VISUAL SIGNALS FOR AIRCRAFT	PHRASE & PRONUNCIATION	APPROPRIATE RESPONSE
You are in close proximity to our national territory.	Day or Night - The intercepting aircraft, flying abeam and parallel to the intercepted aircraft, rocking wings, and flashing navigation lights at slow regular intervals, followed by a series of shallow bank "S" turns approximately 10 degrees either side of center.	"CLOSE TO TERR-I-TORY"	Intercepted aircraft turns away from national territory, as appropriate.
You have entered into our national territory.	Day and Night - The intercepting aircraft, flying abeam and parallel to the intercepted aircraft, rapidly flashing navigation lights while rocking wings, followed by a shallow bank (15 to 20 degrees) turn in the direction of the intercepted aircraft. The approach will be accomplished with great caution and not closer than one wing span. Repeat until intercepted aircraft acknowledges or radio contact is established.	"TERR-I-TORY ENTERED"	Intercepted aircraft will follow the appropriate instructions of the intercepting aircraft, or exit national territory, as appropriate.
I need to land.	Day and Night - Repeated flashing of navigation lights while rocking wings, followed by a gentle porpoising of the aircraft.	"RE-QUEST LAN-DING"	Intercepting aircraft assists intercepted aircraft.
My aircraft request contact with your ship on 243.0 MHz (or 121.5 MHz, if on Civil Band).	Day or Night - Aircraft circling the ship, in a left hand turn, at a safe distance and altitude until radio contact is established.	"RA-DI-O CON-TACT"	After the ship and aircraft each exchange the phrase "RADIO CONTACT," the ship or aircraft will switch to 278.0 MHz (or 130.0 MHz, as appropriate) for further communications.

A-54 EMERGENCY PROCEDURES

MEANING OF SIGNAL PHRASE	VISUAL SIGNALS FOR AIRCRAFT	PHRASE & PRONUNCIATION	APPROPRIATE RESPONSE
I request radio contact on 278.0 MHz or 130.0 MHz. Make initial contact on 243.0 MHz (or 121.5 MHz, if on Civil Band).	Day or Night - (for aircraft, if 121.5 MHz or 243.0 MHz is inoperative) - Intermittent flashing of anticollision lights while rocking wings.	"RA-DI-O CON-TACT"	Acknowledge requesting aircraft, ship, or air traffic control or monitoring facility with the phrase "RADIO CONTACT." After this phrase is exchanged, tune to 278.0 MHz or 130.0 MHz, if operating on Civil Bands.
I am experiencing a dangerous level of interference with my command and control network. (Transmit PHRASE on contact frequency.)	None.	"STOP IN-TER-FER-ENCE"	Investigate and, as appropriate, terminate any activities that may be causing the dangerous interference.
My intended use of a laser may create danger in this area. (Transmit PHRASE on contact frequency.)	None.	"LA-SER DAN-GER"	Take appropriate measures to prevent harm to personnel or damage to equipment.
I am experiencing a dangerous level of laser radiation. (Transmit PHRASE on contact frequency.)	None.	"STOP LA-SER"	Investigate and, as appropriate, terminate any use of a laser that could cause harm to personnel or damage to equipment.

TABLE II
ADDITIONAL TERMINOLOGY

PHRASE	MEANING
"WILCO"	Understood and will comply
"CANNOT"	Understood and unable to comply
"REPEAT"	Say again
"AM LOST"	Position unknown
"MAYDAY"	Am in distress
"DESCEND"	I require descent

i. LANDING OF US AIRCRAFT IN RUSSIA - Should circumstances dictate a need for an immediate landing in Russia, accomplish the following actions:

- (1) Attempt to establish radio contact with Russian air traffic control using frequencies, call signs and procedures specified in paragraphs e., f. and g.
- (2) Advise the Russian controlling agency or interceptor with the phrase "Request Landing" or the appropriate visual signal from Table I. The Russian controlling agency or interceptor should provide assistance if possible.

EMERGENCY PROCEDURES A-55

- (3) Expect to be directed or escorted to a suitable airport.
- (4) Upon landing, expect to be parked on an isolated part of the airport or a separate hangar.
- (5) Use the US/Russia Checklist in Table III to communicate minimum essential information to the Russian airport manager. Request billeting, messing and transportation for aircrew and passengers. US aircrews should expect assistance in arranging billeting, messing, transportation and filing flight plans.
- (6) Secure the aircraft. It may be necessary to use aircrew members or passengers to provide a continuous presence at the airport.
- (7) The aircraft is not subject to any inspection except in cases where the aircraft poses a clear hazard to the environment or the health of personnel. Action may be taken to terminate the hazard. Refer questions involving inspections to higher representatives of the US and Russian military for resolution.
- (8) Request assistance to contact the US Defense Attache at the US Embassy in Moscow as soon as possible. Telephone number is Direct Dial: (095)956-4113 or OPERATOR ASSISTED (095) "-2451 through 2459 during duty hours or Marine Guard at (095) "-1898 or 255-5123 during nonduty hours.
- (9) Determine maintenance and logistic support needed to launch the aircraft. Inform Russian officials and the US Defense Attache of the required support.
- (10) Sign no documents. Request that all bills be forwarded to the US Embassy for payment. Request copies of all bills.
- (11) Depart the Russian airport as soon as practical.

A-56 EMERGENCY PROCEDURES

TABLE III US/RUSSIAN CHECKLIST FOR AIRCRAFT LANDING IN THE OTHER PARTY'S TERRITORY

US/RUSSIAN CHECKLIST FOR AIRCRAFT LANDING IN THE OTHER PARTY'S TERRITORY

ИНФОРМАЦИЯ О САМОЛЕТЕ РФ ИЛИ
США СОВЕРШИВШЕМ ЛОСАДКУ НА
ТЕРРИТОРИИ ДРУГОЙ СТОРОНЫ

On board the aircraft: - Number of crewmembers (attach crew list)	На борту самолета: - Численность экипажа (приложить список экипажа)
- Number of passengers (attach passenger list)	- Количество пассажиров (приложить список пассажиров)
Hazardous cargo Yes No	Опасный груз Да Нет
Does anyone need medical assistance? Yes No	Требуется ли медицинская помощь Да Нет
Does the aircraft require maintenance? Yes No	Требуется ли Да Нет

I request to telephone the American Embassy immediately. Please dial Moscow (095) 252-2451 through 2459. If after 18:00 hours Moscow time, dial Moscow (095) 252-1898 or 255-5123.

Прошу немедленной телефонной связи с Американским посольством в Москве. Набирать Московские номера (095) 252.24.51-59. После 18 часов по Московскому времени набирать (095) 252.18.98 или (095) 255.51.23 в Москве.

I request to telephone the Russian Embassy immediately. Please dial Washington, DC phone number (202) 965-1181.

Прошу немедленной телефонной связи с Российским посольством в Вашингтоне. Набирать вашингтонский номера (202) 965-1181.

Surname of aircraft commander:

Фамилия командира самолета:

Date:

Дата

NOTE: All bills will be forwarded to the respected embassies.

Примечание: Все счета направляются в соответствующие посольства.

NATL/INTL FLIGHT DATA/PROCEDURES B-1

SECTION B

NATIONAL AND INTERNATIONAL FLIGHT DATA AND PROCEDURES

TABLE OF CONTENTS

	<u>PAGE NO.</u>
CIRVIS Reports	B-40
FAA Air Traffic Control Procedures	B-2
Air/Ground Communications	B-2
Altimeter Changeover Procedures	B-3
ATC Radar Beacon System	B-4
Course Changes While Operating Under IFR Rules Below 18,000' MSL	B-2
Entering and Departing Positive Control Area	B-3
FAA (FSS) Fast File Flight Plan System	B-25
ICAO HF Aeronautical Station List	B-48
Lighting Systems	
Approach Lighting Systems	B-31
Pilot Control of Airport Lighting	B-30
Wave-Off Lighting at USN/USMC Airports	B-29
Joint Spectrum Interference Resolution (JSIR) Procedures	B-41
Mode 4, Register of National Clearances and Operational Restrictions	
On the Use of IFF Mark XII	B-68
Oceanic Area Common VHF Frequencies	B-23
Pollution Report (POLREP) Format	B-42
Position Reporting Procedures	
FAA	B-5
ICAO	B-7
OCEANIC	B-9
IATA In-Flight Broadcast Procedures Africa Region	B-17
IATA In-Flight Broadcast Procedures CSA Region	B-19
Runway Condition Reading (RCR) CORRELATION CHART	B-28
USAF Bird Watch Condition Code	B-24
USAF High Frequency Global Communications System (HF-GCS)	B-43
RVSM Basic Concept for Contingencies	B-67

B-2 NATL/INTL FLIGHT DATA/PROCEDURES

1. FAA AIR TRAFFIC CONTROL PROCEDURES

a. AIR/GROUND COMMUNICATIONS

(1) (All VFR Operations except "VFR Conditions on Top" will utilize FSS frequency 255.4 MHz as primary frequency for position reporting.

(2) (FLIGHT SERVICE STATION (FSS) VHF RADIO FREQUENCY PLAN - This plan establishes standards and criteria for VHF radio frequency assignment in order to reduce frequency congestion and its related problems of interference within the system. FSS UHF frequencies are not affected.

(a) (The FSS VHF frequency assignment will be as follows:

1. At airports with full-time FSS and part-time towers the FSS will use the local control frequency for Airport Advisory Service (AAS) when tower is closed.

2. At non-tower airports, 123.6 will provide AAS or flight plan servicing.

3. 122.2 will be available at all FSSs to provide common enroute simplex service.

4. One or two additional enroute simplex frequencies, each protected for the service volume of the facility, will be available at most FSSs. When possible these additional frequencies are to be used instead of the common enroute simplex frequency.

5. Enroute Flight Advisory Service (EFAS) will be provided on 122.0.

6. RCO "A" service (receive only) collocated with the VOR will be available on 122.1. RCO "B" service (simplex) will be available on a frequency selected from the FSS allocation.

7. 121.5 will continue to serve as the emergency frequency. In addition, tower receive-only service, will be provided on 122.5 at qualifying terminal locations.

(b) If two-way communications cannot be established when changing frequencies, a pilot should attempt to re-contact the transferring controller for the assignment of an alternative frequency or other instructions. If, however, communications are not re-established, the pilot should then contact the appropriate communications medium as indicated below:

1. VHF FSS 122.2 or other frequencies published in enroute supplement.

2. UHF FSS 255.4 (272.7 is now available only in the Pacific and at select stations in the conterminous U.S. where it is used at the option of the pilot.)

b. COURSE CHANGES WHILE OPERATING UNDER IFR RULES BELOW 18,000' MSL (FAA-07400.9)

(1) In the development of the two-level airspace structure the Federal Aviation Administration (FAA) considered the probability of an aircraft exceeding the airway/route boundaries while making course changes at different speeds. The normal navigational aid spacing for airways/routes below 18,000 feet MSL is 80 nautical miles and the airspace area to be protected has a total width of 8 nautical miles, 4 nautical miles each side of centerline, within 51 nautical miles of the facility. Beyond 51 nautical miles the 4.5 degree accuracy factor determines the width of the airways/routes approximately 2 NM in total width every 13 NM). It was evident that aircraft operating in excess of 290 knots true airspeed (TAS) could exceed the normal airway/route boundaries depending on the amount of course change required, wind direction, and velocity, the character of the turning fix (distance measuring equipment, overhead navigation aid, or intersection), and the pilot's technique in making a course change. For example, a flight operating at 17,000 feet MSL with a TAS of 400 knots, a 25 degree bank, and a course change of more than 40 degrees would exceed the width of the airway/route; i.e., 4 nautical miles each side of centerline. As a result, the FAA: (1) took action to assure proper obstruction clearance for all

NATL/INTL FLIGHT DATA/PROCEDURES B-3

known turning operations, and (2) provided additional instrument flight rules (IFR) separation protection for turns.

(2) In the airspace at and above 18,000 feet MSL additional IFR separation protection is provided for turns. However, in the airspace below 18,000 feet MSL, where operations in excess of 290 knots TAS are less prevalent, the provision of additional IFR separation in all course change situations for the occasional aircraft making a turn in excess of 290 knots TAS creates an unacceptable waste of airspace and imposes a penalty upon the preponderance of traffic which operate at low speeds. Pilots are reminded that special attention must be given to the matter of making course changes so as to adhere as closely as possible to the airway/route being flown.

c. ENTERING AND DEPARTING CLASS A AIRSPACE

(1) Pilots operating on IFR flight at an assigned FL require no additional clearance.

(2) Pilots operating VFR and VFR-on-top (on IFR flight plan) must obtain an ATC clearance with an assigned FL prior to entering positive control area. An abbreviated flight plan containing the following information must be provided ATC at least 30 minutes prior to estimated penetration.

- (a) Identification
- (b) True air speed (TAS)
- (c) VFR position and altitude/flight level
- (d) Estimated time and point of penetration
- (e) Requested route and flight level

(3) When flight inbound to destination is VFR-on-Top above the Class A Airspace or departure from the area is to be IFR/VFR-on-Top, only the discrete frequency of the sector of arrival or departure need be pre-set.

(4) Upon departing the area, IFF/SIF should be reset to the proper Mode 3/A Code as assigned by ATC.

(5) Pilots flying aircraft without manual tuning capability should preset required frequencies prior to departure. If after pre-setting required frequencies, communications cannot be made or maintained on sector discrete frequencies, contact will be made through the nearest FSS on frequency 255.4 MHz (272.7 MHz may be available).

d. ALTIMETER CHANGEOVER PROCEDURES

(1) CLIMB - change to 29.92" upon reaching 18,000 ft MSL

(2) DESCENT - change to the local altimeter setting prior to descent through altitude as indicated on the following QNH-FL tabulation. In no case will the change be made lower than a flight level equivalent to 18,000 ft MSL.

LOCAL ALTIMETER SETTING

FLIGHT LEVEL

29.92 or higher	180
29.91 to 29.42	185
29.41 to 28.92	190
28.91 to 28.42	195
28.41 to 27.92	200
27.91 to 27.42	205
27.41 to 26.92	210

B-4 NATL/INTL FLIGHT DATA/PROCEDURES

EXAMPLE: Local altimeter 28.91, pilot must change no lower than flight level 195.

(3) MINIMUM FLIGHT LEVELS - The table in paragraph d.(2) above will be used to determine the lowest usable flight level.

(4) See FLIP Area Planning documents for procedures outside of U. S. airspace.

e. ATC RADAR BEACON SYSTEM

(FAA 7110.65, FAA 7610.4)

(1) Pilots of aircraft operating IFR and equipped with a coded radar beacon transponder will be instructed by ATC to reply on a specified Mode 3/A Code. When a flight has been assigned a particular code, it will remain on that code until further advised by ATC.

(a) VFR or VFR conditions on top, or an aircraft which cancels its IFR flight plan.
Code 1200

NOTE: VFR is not authorized within CLASS A AIRSPACE.

(b) Special Operations:

1. Interceptor aircraft on active air defense missions without an ATC clearance.
Code 7777

2. Aircraft operations which specify frequent or rapid changes in altitude/FL (flight test, olive branch, refueling, etc.) when assigned by ATC.
Code 4000

3. Mission requirements permitting aircraft operating in restricted/warning areas unless a different code has been assigned by advance coordination or via direct communications with ATC.
Code 4000

(c) Mode 3/A - Code 4400, has been assigned for aircraft operating above FL 600. This code will be preset on the ground and will not be changed in flight. However, the emergency code 7700 can be activated.

(d) U.S. and ICAO ATC facilities recognize the Mode 3/A, Code 7500 as meaning that the aircraft is being "Hijacked/forced to a new destination". Use Code 7500 to indicate a hijacking threat when under ATC Radar Control. When the situation precludes Code 7500 replies, the spoken words indicating such a squawk will receive similar ATC interpretation and action. Air traffic controllers will acknowledge and confirm receipt by asking the pilot if the code is intentionally being used. If the pilot replies in the affirmative, or does not reply, the Controller shall not ask further questions but will flight follow, respond to pilot's requests, and notify appropriate authorities.

(e) Aircraft equipped with transponders that have pressure altitude reporting capability will use this capability unless otherwise directed by ATC.

NATL/INTL FLIGHT DATA/PROCEDURES B-5

2. POSITION REPORTING PROCEDURES

a. POSITION REPORTS - FAA

(AIM)

(1) Position Reporting Points - Federal Aviation Regulations require pilots to maintain a listening watch on the appropriate frequency and unless operating under the provisions of paragraph (4) to furnish position reports passing certain reporting points. Reporting points are indicated by symbol on enroute charts. The designated compulsory reporting point symbol is the solid triangle and the "on request" reporting point symbol is an open triangle. Reports passing an "on request" reporting point are only necessary when requested by ATC.

(2) When operating in a nonradar environment:

(a) On initial contact, the pilot should inform the controller of the aircraft's present position, altitude and time estimate for the next reporting point.

Example: (Name) CENTER (aircraft identification), (position), (altitude), ESTIMATING (reporting point) AT (time).

(b) After initial contact, when a position report will be made, the pilot should give the controller a complete position report.

Example: (Name) CENTER (aircraft identification), (position), (time), (altitude), (type of flight plan), (ETA and name of next reporting point), (the name of the next succeeding reporting point), and (remarks).

(3) When operating in a radar environment:

(a) On initial contact, the pilot should inform the controller of the aircraft's assigned altitude preceded by the words "level", or "climbing to", or "descending to", as appropriate; and the aircraft's present vacating altitude, if applicable.

Examples: (Name) CENTER, (aircraft identification), AT (altitude or flight level), or if appropriate, LEAVING (exact altitude or flight level) (CLIMBING or DESCENDING) TO MAINTAIN (altitude or flight level).

NOTE: Exact altitude or flight level means to the nearest 100 foot increment. Exact altitude or flight level reports on initial contact provide ATC with information required prior to using MODE C altitude information for separation purposes.

(4) Position Reporting Requirements

(a) Flight along airways/routes - A position report is required by all flights regardless of altitude, including those operating in accordance with an ATC clearance specifying "VFR on TOP," over each designated compulsory reporting point along route being flown.

(b) Flight along a Direct Route - Regardless of the altitude or flight level being flown, including flights operating in accordance with an ATC clearance specifying "VFR on TOP," pilots shall report over each reporting point used in the flight plan to define the route of flight.

(c) Flights in a Radar Environment - ATC will inform a pilot that he is in "RADAR CONTACT":

1. When aircraft is initially identified in the ATC system; and

2. When radar identification is re-established after radar service has been terminated or radar contact lost. Subsequent to being advised that the controller has established radar contact, this fact will not be repeated to the pilot when handed off to another controller. At times, the aircraft identity will be confirmed by the receiving controller; however, this should not be construed to mean that radar contact has been lost. The identity of transponder equipped aircraft will be confirmed by asking the pilot to "IDENT," "SQUAWK STANDBY," or to change codes. Aircraft without transponders will be advised of their position to confirm identity. In this case, the

B-6 NATL/INTL FLIGHT DATA/PROCEDURES

pilot is expected to advise the controller if he disagrees with the position given. If the pilot cannot confirm the accuracy of the position given because he is not tuned to the NAVAID referenced by the controller, the pilot should ask for another radar position relative to the NAVAID to which he is tuned.

(d) When informed by ATC that their aircraft are in "RADAR CONTACT," PILOTS SHOULD DISCONTINUE POSITION REPORTS OVER DESIGNATED REPORTING POINTS. They should resume normal position reporting when ATC advises "RADAR CONTACT LOST" or "RADAR SERVICE TERMINATED."

(5) Position Report Items

(a) Identification.

(b) Position.

(c) Time.

(d) Altitude or flight level (include actual altitude or flight level when operating on a clearance specifying "VFR ON TOP").

(e) Type of flight plan (not required in IFR position reports made directly to ARTC Centers or approach control).

(f) ETA and name of next reporting point.

(g) The name only of the next succeeding reporting point along the route of flight, and

(h) Pertinent remarks.

(6) Additional Reports - The following reports should be made to ATC or FSS facilities without a specific ATC request:

(a) At all times:

1. When vacating any previously assigned altitude or flight level for a newly assigned altitude or flight level.

2. When an altitude change will be made if operating on a clearance specifying "VFR ON TOP."

3. When unable to climb/descend at a rate of at least 500 feet per minute.

4. When approach has been missed. (Request clearance for specific action; i.e., to alternative airport, another approach, etc.).

5. Change in the average true airspeed (at cruising altitude) when it varies by 5 percent or 10 knots (whichever is greater) from that filed in the flight plan.

6. The time and altitude or flight level upon reaching a holding fix or point to which cleared.

7. When leaving any assigned holding fix or point.

NOTE: The reports in subparagraphs 6 and 7 may be omitted by pilots of aircraft involved in instrument training at military terminal area facilities when radar service is being provided.

8. Any loss, in controlled airspace, of VOR, TACAN, ADF, low frequency navigation receiver capability, complete or partial loss of ILS receiver capability or impairment of air/ground communications capability. Reports should include aircraft identification, equipment affected, degree to which the capability to operate under IFR in the ATC system is impaired, and the nature and extent of assistance desired from ATC.

NATL/INTL FLIGHT DATA/PROCEDURES B-7

NOTE: Other equipment installed in an aircraft may effectively impair safety and/or the ability to operate under IFR. If such equipment (e.g. airborne weather radar) malfunctions and in the pilot's judgment either safety or IFR capabilities are affected, reports should be made as above.

9. Any information relating to the safety of flight.

(b) When not in "radar contact".

1. When leaving final approach fix inbound on final approach (nonprecision approach) or when leaving the outer marker or fix used in lieu of the outer marker inbound on final approach (precision approach).

2. A corrected estimate at anytime it becomes apparent that an estimate as previously submitted is in error in excess of three minutes.

(c) Pilots encountering weather conditions which have not been forecast, or hazardous conditions which have been forecast, are expected to forward a report of such weather to ATC.

b. POSITION REPORTING - ICAO

(ICAO DOC 4444)

(1) Transmission of Position Reports

(a) On routes defined by designated significant points, position reports shall be made when over, or as soon as possible after passing, each designated compulsory reporting point, except as provided in b.(1)(b). Additional reports over other points may be requested by the appropriate air traffic services unit when so required for air traffic services purposes.

(b) On routes not defined by designated significant points, position reports shall be made as soon as possible after the first half-hour of flight and hourly intervals thereafter, except as provided in b.(1)(c). Additional reports at shorter intervals of time may be requested by the appropriate air traffic services unit when so required for air traffic services purposes.

(c) Under conditions specified by the appropriate ATS authority, flights may be exempted from the requirement to make position reports at each designated compulsory reporting point or interval. In applying this paragraph, account should be taken of the meteorological requirement for making, recording, and reporting of routine aircraft observations.

NOTE: This is intended to apply in cases where adequate flight progress data are available from other sources, e.g., ground radar, and in other circumstances where the omission of routine reports from selected flights is found to be acceptable.

(d) The position reports required by b.(1)(a) and b.(1)(b) shall be made to the air traffic services unit serving the airspace in which the aircraft is operated. In addition, when so prescribed by the appropriate ATS authority in aeronautical information publications or requested by the appropriate air traffic services unit, the last position report before passing from one flight information region or control area to an adjacent flight information region or control area shall be made to the air traffic services unit serving the airspace about to be entered.

(e) If a position report is not received at the expected time, subsequent control shall not be based on the assumption that the estimated time is accurate. Immediate action shall be taken to obtain the report if it is likely to have any bearing on the control of other aircraft.

(2) Contents of Position Reports

(a) The position reports required by b.(1)(a) and b.(1)(b) shall contain the following elements of information, except that elements 4 and 5 may be omitted from position reports transmitted by radiotelephony, when so prescribed on the basis of regional air navigation agreements:

1. Aircraft identification.

2. Position.

B-8 NATL/INTL FLIGHT DATA/PROCEDURES

3. Time.
4. Flight level or altitude.
5. Next position and time over.
6. Ensuing significant points.

NOTE: Omission of element 4 may be possible when flight level or altitude, as appropriate, derived from SSR Mode C information can be made continuously available to controllers in a labeled form, and when adequate procedures have been developed to guarantee the safe and efficient use of SSR Mode C information.

(3) Reporting of Operational and Meteorological Information

(a) When operational and/or routine meteorological information is to be reported by an aircraft enroute or times when position reports are required in accordance with b.(1)(a) and b.(1)(b) the position report shall be given in the form of an air-report. Special aircraft observations shall be reported as special air-reports, as soon after they have been made as is practicable.

(b) Contents of air-reports

1. Air-reports shall give information relating to such of the following elements as necessary for compliance with b.(3)(b)2.:

Section 1. - Position Information

Element 1	Aircraft identification
Element 2	Position
Element 3	Time
Element 4	Flight level or altitude
Element 5	Next position and time over
Element 6	Ensuing significant points.

Section 2. - Operational Information

Element 7	Estimated time of arrival
Element 8	Endurance

Section 3. - Meteorological Information

Element 9	Air temperature
Element 10	Wind
Element 11	Turbulence
Element 12	Aircraft icing
Element 13	Supplementary information

2. Section 1 of the air-report is obligatory, although Element 5 and 6 thereof may be omitted when prescribed in Regional Supplementary Procedures; Section 2 shall be added, in whole or in part, only when so requested by the operator or his designated representative, or when deemed necessary by the pilot-in-command; Section 3, in whole or in part, shall be added in accordance with ICAO Annex 3 and the Regional Supplementary Procedures, Part 3 - Meteorology.

NOTE: While element 4, flight level or altitude, may be omitted from the contents of a position report transmitted by radiotelephony when so prescribed on the basis of regional air navigation agreements, that element may not be omitted from Section 1 of an air-report.

3. Compilation of air-reports - Air-reports containing a Section 3 shall be recorded on the AIREP form. Forms based on the model AIREP form shown in this publication shall be provided for the use of flight crew in compiling the reports. The detailed instructions for

NATL/INTL FLIGHT DATA/PROCEDURES B-9

recording and reporting as given, shall be complied with.

NOTE: The recording and reporting instructions may conveniently be printed on the back of the AIREP form.

4. Transmission of air-reports - The formats of messages and the phraseologies or data conventions given shall be used by flight crew when transmitting air-reports and by air traffic services personnel when re-transmitting such reports.

NOTE: Increasing use of air-reports in automated systems makes it essential that the elements of such reports be transmitted in the order and form prescribed.

5. Aircraft observations during climb-out or approach - Aircraft observations made during the climb-out and approach phases of flight shall be reported as soon as is practicable.

c. POSITION REPORTING - OCEANIC

(1) Position Reports - Position Reports shall be made at designated lines of latitude or longitude.

(a) Flights whose tracks are predominately East and West shall report over each 5 degrees or 10 degrees (10 degrees will be used if the speed of the aircraft is such that 10 degrees will be traversed within 1 hr) meridian of longitude extending East and West from 180 degrees.

(b) Flights whose tracks are predominately North and South shall report over each 5 degrees or 10 degrees (10 degrees if traversed within 1 hr and 20 min) parallel of latitude extending North and South of the equator.

(c) Air Traffic Service may require specific flights to report more frequently than each 5 degrees fix (each 2 1/2 degrees) for aircraft with slow ground speeds.

(d) The Position Report shall be transmitted at the time of crossing the designated reporting line or as soon thereafter as possible.

(2) Position Report Contents

(a) Present Position - The present position shall include the following in case of East-West flights:

1. Latitude in degrees and minutes.
2. Longitude in degrees only (see note below).
3. Time.
4. Altitude (flight level).

NOTE: In case of North-South flights 1 and 2 above would change, as appropriate, by reporting latitude in degrees only and longitude in degrees and minutes.

(b) Estimated next position - the estimated next position shall include the following:

1. Latitude.
2. Longitude.
3. Estimated time at the next position line. A revision of the estimate of the next position line will be made when the original estimate is in error in excess of 3 minutes.
4. Ensuing significant points.
5. Late Position Reports - When normal air-ground communications have been lost by the aircraft, causing a position report to be 30 minutes overdue, and communications can

B-10 NATL/INTL FLIGHT DATA/PROCEDURES

be established with any radio station including Ocean Station Vessels or airborne aircraft which have communications established with any radio station, aircraft commanders shall relay through such radio stations a position report with priority precedence to the appropriate area control center.

(3) Areas of Application

(a) Fixed Line Position - Reporting will be applied by all operators in the areas of United States responsibility south of 45 degrees North Latitude in the north Pacific Region. This specifically includes all of the Oakland, Honolulu, and Guam Control Areas. Because of the lower traffic density north of 45 degrees North, Fixed Line Position Reporting will be optional with the individual operators.

(b) Special Mission Exception - Certain missions such as Search and Rescue, Anti-submarine, Weather Observations, etc., have a requirement for use of an optional reporting form. These flights shall so advise Air Traffic Service of the reporting form to be used.

NOTE: When traversing the North Atlantic Region, refer to DoD FLIP, Area Planning (AP/2), Europe, Africa, and Middle East for additional specific reporting procedures with this region.

d. AIREP EXAMPLES

(1) As spoken in telephony;

- I AIREP SPEEDBIRD FIVE SIX AIT POSITION FOWER NINER NORTH ZERO FIVE ZERO WEST AT WUN TREE WUN SEVEN FLIGHT LEVEL TREE WUN ZERO NEXT POSITION FIVE ZERO NORTH ZERO FOWER ZERO WEST AT WUN TREE FIVE FIVE FOLLOWING POINT FIVE ZERO NORTH ZERO TREE ZERO WEST ENDURANCE ZERO AIT TREE ZERO TEMPERATURE MINUS FOWER SEVEN WIND TOO FIVE FIVE DEGREES SIX FIVE KNOTS TURBULENCE MODERATE SCATTERED CUMULONIMBUS TOP FLIGHT LEVEL TOO AIT ZERO
- II AIREP JAPANAIR FOWER FOWER WUN OVER ORDON AT ZERO NINER TREE ZERO FLIGHT LEVEL TREE FIVE ZERO NEXT POSITION ONADE AT WUN ZERO ZERO SEVEN FOLLOWING POINT OMPPA TEMPERATURE MINUS FIVE TREE WIND TREE WUN ZERO DEGREES SIX ZERO KILOMETRES PER HOUR MEAN FIVE FIVE NORTH WUN SEVEN SIX WEST
- III AIREP SPECIAL UNITED WUN ZERO WUN POSITION FIVE ZERO FOWER FIVE NORTH ZERO TOO ZERO WUN FIVE WEST AT WUN FIVE TREE SIX FLIGHT LEVEL TREE WUN ZERO CLIMBING TO FLIGHT LEVEL TREE FIVE ZERO NEXT POSITION FIVE WUN NORTH ZERO TREE ZERO WEST AT WUN SIX TOO WUN FOLLOWING POINT FIVE WUN NORTH ZERO FOWER ZERO WEST ENDURANCE ZERO NINER ZERO ZERO ICING SEVERE
- IV AIREP SPECIAL NIUGINI TOO SEVEN TREE OVER MADANG AT ZERO AIT FOWER SIX WUN NINER TOUSAND FEET TURBULENCE SEVERE

(2) As recorded by aeronautical stations and transmitted in telephony (including teletypewriting);

- I ARP BAW568 49N050W 1317 F310 50N040W 1355 50N030W FUEL 0830 MS47 255/65 KT TURB MOD SCT CB TOP F280
- II ARP JAL441 ORDON 0930 F350 ONADE 1007 OMPPA MS53 310/60KMH MEAN 55N176W
- III ARS UAL101 5045N02015W 1536 F310 ASC F350 51N030W 1621 51N 040W FUEL 0900 ICE SEV
- IV ARS ANG273 MD 0846 19000FT TURB SEV

NATL/INTL FLIGHT DATA/PROCEDURES B-11

(3) Explanation of examples;

(a) The first example is a routine air-report for a transoceanic flight which has been designated to report routine meteorological observations at meridians spaced at intervals of 10 degrees. The wind reported is spot wind.

(b) The second example is a routine air-report for a transoceanic flight which is required to report routine meteorological observations at specified significant points. The wind reported, in kilometres per hour, is mean wind between the position reported and the previous fix.

(c) The third example is a special air-report which is required because of severe icing and is reported at the same time as a routine position report. It will be noted that the aircraft is climbing.

(d) The fourth example is a special air-report which is required because of severe turbulence encountered between air-reports. The aircraft is on QNH altimeter setting.

B-12 NATL/INTL FLIGHT DATA/PROCEDURES

	MODEL AR	AIREP
	RECORD AND TRANSMIT IN TELEGRAPHY (including teletypewriting)* as appropriate	TRANSMIT IN TELEPHONY* as appropriate
	1 ARP or ARS	**AIREP or AIREP SPECIAL
1	(aircraft identification)	(aircraft identification)
2	(latitude) N or S (longitude) E or W (significant point) ABM (significant point) (significant point) (bearing) (distance)	POSITION (latitude and longitude) OVER (significant point) ABEAM (significant point) (significant point) (bearing) (distance)
3	(time)	AT (time)
4	F (flight and level number) (number) M or FT ASC F (flight level number) or (number) M or FT DES F (flight level number) or (number) M or FT	FLIGHT LEVEL (number) (number) METERS or FEET CLIMBING TO FLIGHT LEVEL (number) or (number) METERS or FEET DESCENDING TO FLIGHT LEVEL (number) or (number) METERS or FEET
5	(next position) (time)	NEXT POSITION (position AT (time)
6	(ensuing significant point)	FOLLOWING POINT (position)
7	ETA (aerodrome) (time)	ESTIMATING ARRIVAL (aerodrome) AT (time)
8	FUEL (hours and minutes)	ENDURANCE (hours and minutes)
9	PS (degrees Celsius) MS (degrees Celsius)	TEMPERATURE PLUS (degrees Celsius) TEMPERATURE MINUS (degrees Celsius)
10	(degrees)/(number) KMH or KT (MEAN) LV (MEAN) (latitude) N or S (longitude) E or W	WIND (number) DEGREES (number) KILOMETERS PER HOUR or KNOTS (MEAN) WIND LIGHT AND VARIABLE (MEAN) POSITION (latitude and longitude)
11	TURB MOD TURB SEV (INC)	TURBULENCE MODERATE TURBULENCE SEVERE (IN CLOUD)
12	ICE MOD ICE SEV	ICING MODERATE ICING SEVERE

NATL/INTL FLIGHT DATA/PROCEDURES B-13

	MODEL AR	AIREP
13	RA SN FZRA FC TS FRONT SCT BKN CNS CB BASE F (flight level number) or (number) M or FT TOP F (flight level number) or (number) M or FT TURB MOD } If observed prior to ICE MOD } last 10 minutes. (Significant radar echoes) (Difference between observed and forecast weather) AT (position of phenomenon reported under item 12 if different from that reported under item 2)	RAIN SNOW FREEZING RAIN FUNNEL CLOUD THUNDERSTORM FRONT SCATTERED BROKEN CONTINUOUS CUMULONIMBUS BASE FLIGHT LEVEL (number) or (number) METERS or FEET TOP FLIGHT LEVEL (number) or (number) METERS or FEET TURBULENCE MODERATE ICING MODERATE AT

*Increasing use of air-reports in automated systems makes it essential that the elements of such reports be transmitted in the order and form prescribed.

**Only when Section 3 is included. When Section 3 is not included, the word "POSITION" may be used in telephony.

AIREP

IV

Operator.....		Aircraft identification (as per item 7 - 5.6.8.....)
Addresssee	GANDER	
↑ Message type designator	ARP	
1 Aircraft identification	BAW568	
2 Position	49N050W	
3 Time	1317	
4 Flight level or altitude	F310	
5 Next position and time over	50N040W 1355	
6 Ensuing significant point	50N030W	
7 Estimated time of arrival		
8 Endurance	FUEL 0830	
9 Air temperature	MS47	
10 Spot wind or mean wind and position thereof	255/65KT	
11 Turbulence	TURB MOD	
12 Aircraft icing		
13 Supplementary information	SCT CB TOP F280	
Time transmitted	1320	

II

Operator.....		Aircraft identification (as per item 7 - 4.4.1.....)
Addresssee	REYKJAVIK	
↑ Message type designator	ARP	
1 Aircraft identification	JAL441	
2 Position	0RD0N	
3 Time	0930	
4 Flight level or altitude	F350	
5 Next position and time over	0NADE 1007	
6 Ensuing significant point	0MPPA	
7 Estimated time of arrival		
8 Endurance		
9 Air temperature	MS53	
10 Spot wind or mean wind and position thereof	310/60KMH MEAN 55N176W	
11 Turbulence		
12 Aircraft icing	ICE SEV	
13 Supplementary information		
Time transmitted	0932	

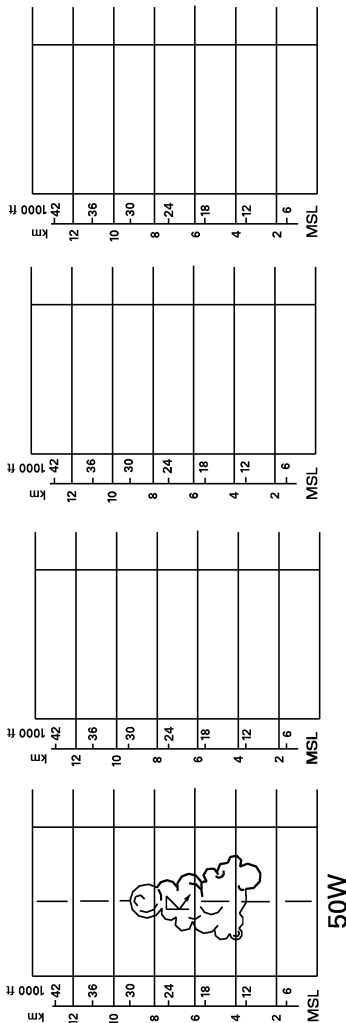
III

Operator.....		Aircraft identification (as per item 7 - 2.7.3 of flight plan).....
Addresssee	SHANWICK	
↑ Message type designator	ARS	
1 Aircraft identification	UAL101	
2 Position	5045N 02015W	
3 Time	1536	
4 Flight level or altitude	F310 ASC F350	
5 Next position and time over	51N030W 1621	
6 Ensuing significant point	51N040W	
7 Estimated time of arrival		
8 Endurance	FUEL 0900	
9 Air temperature		
10 Spot wind or mean wind and position thereof		
11 Turbulence	TURB SEV	
12 Aircraft icing		
13 Supplementary information		
Time transmitted	1539	

Note: Completed forms can be computer generated, typed or handwritten.

AIREP

PICTORIAL CROSS-SECTION**



50W

SYMBOLS	
	RAIN
	FREEZING RAIN
	SAND OR DUST STORM
	STORM OR DIRTING SNOW
	ICE PELLETS
	SNOW AND RAIN MIXED
	SNOW
	HAIL
	MODERATE ICING
	SEVERE ICING
	MODERATE TURBULENCE
	SEVERE TURBULENCE
	SQUALL
	THUNDER STORM
	LIGHTNING
	TROPICAL REVOLVING STORM
	MARKED MOUNTAIN WAVES

** Information entered on this pictorial cross-section is intended to supplement the observations recorded on this form when, in the opinion of the pilot-in-command, a graphical representation will usefully amplify or assist in clarifying the observations recorded elsewhere on this form.

B-16 NATL/INTL FLIGHT DATA/PROCEDURES

SPECIAL AIR-REPORT OF VOLCANIC ACTIVITY

MODEL VAR

Aircraft Identification
(as per item 7)

Operator of flight plan) Pilot-in-
command Date Time UTC

Dep. from Date Time UTC
Arr. at Date Time UTC

Addressee		AIREP SPECIAL	
1 Aircraft identification			
2 Position			
3 Time			
4 Flight level or altitude			
5 VOLCANIC ACTIVITY OBSERVED AT			
6 Air temperature			
7 Spot wind			
8 Supplementary information (Brief description of activity, including vertical and lateral extent of ash cloud, horizontal movement, rate of growth, etc. as available)			
The following information is not for transmission by RTF			
Section 1		Section 2	
9 Density of ash cloud	(a) wispy	<input type="checkbox"/>	<input checked="" type="checkbox"/> THE APPROPRIATE BOX
10 Colour of cloud	(a) white (d) black	<input type="checkbox"/>	(b) moderate dense <input type="checkbox"/>
11 Eruption	(a) continuous	<input type="checkbox"/>	(b) light grey <input type="checkbox"/>
12 Position of activity	(a) summit (d) multiple	<input type="checkbox"/>	(b) intermittent <input type="checkbox"/>
13 Other observed features of eruption	(a) lightning (d) ash fall out	<input type="checkbox"/>	(b) side <input type="checkbox"/>
14 Effect on aircraft	(a) communications (d) pitot static (g) nil	<input type="checkbox"/>	(e) not observed <input type="checkbox"/>
15 Other effects	(a) turbulence (d) ash deposits	<input type="checkbox"/>	(e) mushrooming cloud <input type="checkbox"/>
16 Other information	Add any information considered useful	<input type="checkbox"/>	(b) nav. systems <input type="checkbox"/>
		<input type="checkbox"/>	(e) windscreen <input type="checkbox"/>
		<input type="checkbox"/>	(f) nil <input type="checkbox"/>
		<input type="checkbox"/>	(c) engines <input type="checkbox"/>
		<input type="checkbox"/>	(f) windows <input type="checkbox"/>
		<input type="checkbox"/>	(c) fumes <input type="checkbox"/>

NATL/INTL FLIGHT DATA/PROCEDURES B-17

e. IATA INFLIGHT BROADCAST PROCEDURES (IFBP) AFRICA REGION ON 126.9 (AFFSA/TFMWWG-E)

(1) Listening Watch-A listening watch should be maintained on 126.9 10 minutes before entering the designated airspace until leaving this airspace. For an aircraft taking off from an aerodrome located within the lateral limits of the designated airspace, listening watch should start as soon as appropriate and be maintained until leaving the airspace.

(2) Time of Broadcast-A broadcast should be English:

(a) 10 minutes before entering the designated airspace or, for a pilot taking off from an aerodrome located within the lateral limits of the designated airspace, as soon as appropriate:

(b) 5 minutes prior to crossing a reporting point.

(c) 5 minutes prior to crossing or joining an ATS route.

(d) at 20 minute intervals between distant reporting points.

(e) 2 to 5 minutes, where possible, before a change in flight level.

(f) at the time of a change in flight level.

(g) at any other time considered necessary by the pilot.

(3) Operating Procedures

(a) Changes of Cruising Level

1 Cruising level change should not be made within the designated airspace unless considered necessary by pilots to avoid traffic conflicts, for weather avoidance, or for other valid operational reasons.

2 When cruising level changes are unavoidable, all available aircraft lighting which would improve the visual detection of the aircraft should be displayed while changing levels.

(b) Collision Avoidance - If, on receipt a traffic information broadcast from another aircraft, a pilot decides that immediate action is necessary to avoid an imminent collision risk to his aircraft, and this cannot be achieved in accordance with the right-of-way provisions of Annex 2, he should:

1 Unless an alternative maneuver appears more appropriate descend immediately 1000 ft if above FL 290 or 500 ft if at or below FL 290.

2 Display all available aircraft lighting which would improve the visual detection of the aircraft.

3 As soon as possible reply to the broadcast advising action being taken.

4 Notify the action taken on the appropriate ATS frequency; and

5 As soon as situation has been rectified, resume normal flight level, notifying the action on the appropriate ATS frequency.

(c) Normal Position Reporting Procedures - Normal position reporting procedures should be continued at all times, regardless of any action taken to initiate or acknowledge a traffic information broadcast..

(d) Operation of Transponders - Pilots should ensure that transponder procedures as contained in ICAO PANS OPS Doc 8168 are compiled with and in the absence of other directions from ATC, operate the transponder on Mode A and C Code 2000. Note: Pilots are advised to ensure operation of transponders even when outside radar coverage in order to enable TCAS

B-18 NATL/INTL FLIGHT DATA/PROCEDURES

equipped aircraft to identify conflicting traffic.

(e) Use of TCAS - TCAS equipped aircraft should have TA/RA mode selected at maximum range.

(4) THE IFBP IN AFI - In many FIRs in the AFI Region communications both fixed and mobile have either not been implemented or operate well below the required reliability. This has an impact on the proper provision of Air Traffic Services, especially flight information service. Consequently, the AFI Regional Technical Conference has decided that IATA In Flight Broadcast Procedure (IFBP) should be used within designated FIRs in the region as an interim measure until such time as communications facilities affecting the FIR in question have been improved.

(5) Designated Frequency in AFI - In the AFI Region the designated frequency for the IFBP is 126.9 MHz.

(6) Area of Application

(a) In the AR Region the IFBP should be applied in the following FIRs and airspaces:

Accra	Dar es Salaam	Mauritius
Addis Ababa	Entebbe	Mogadishu
Alger	Kano	N'Djamena
Antananarivo	Khartoum	Nairobi
Asmara	Kigali	Niamey
Beira	Kinshasa	Roberts
Brazzaville	Lilongwe	Tripoli
Bujumbura	Luanda	
Dakar	Lusaka	

(b) The In-Flight Broadcast Procedure need not be applied in the following FIRs:

Bloemfontein	Dakar Oceanic	Port Elizabeth
Canaries	Durban	Sal Oceanic
Cape Town	Harare	Tunis
Casablanca	Johannesburg	Windhoek

(7) Enforcement

(a) All airlines operating in the AFI region are requested to:

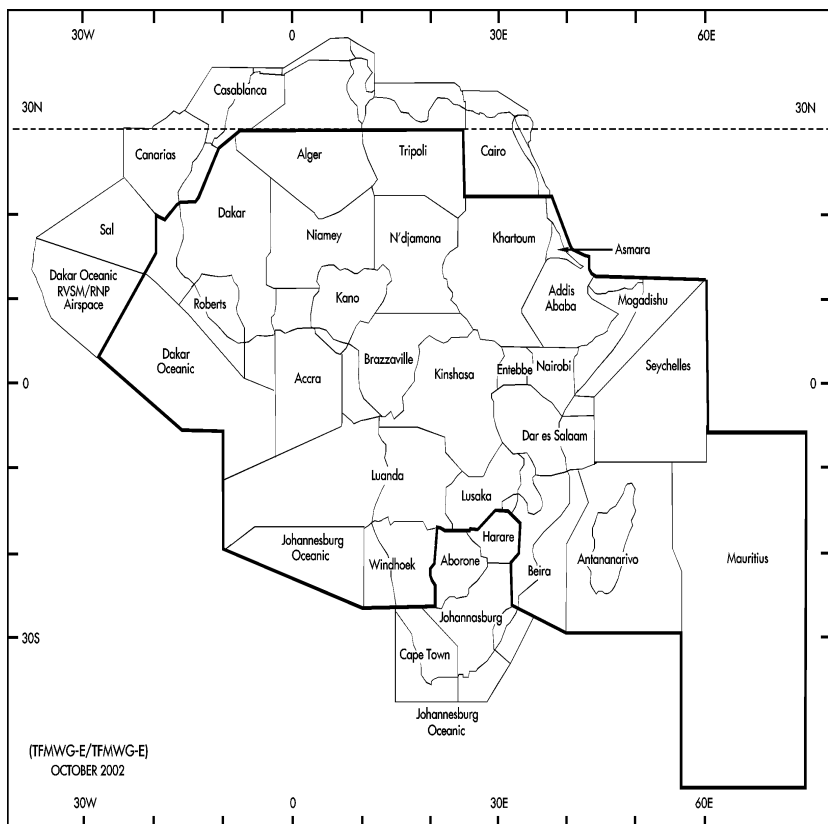
1 Ensure that their aircrews are fully briefed on the procedure and area of application described.

2 Ensure that their charts and flight documentation are fully amended to reflect the foregoing;

(b) Any operator reported to IATA as not applying the procedure shall be contacted immediately, informed of the procedure, and requested to apply it.

(8) Attention is drawn to the fact that during the Haj Pilgrimage period the number of east-west flights in North-Central part of the AFI Region increases dramatically and with it the risk of ATS incidents and the importance of the In-Flight Broadcast Procedure.

IATA IFBP - AREA OF APPLICABILITY AFI REGION



f. IATA IN-FLIGHT BROADCAST PROCEDURE (IFBP) CSA REGION ON 126.95

(AFFSA/AFFSA)

(1) **LISTENING WATCH** - A listening watch should be maintained on a designated frequency 10 minutes before entering the designated airspace until leaving this airspace. For an aircraft taking off from an airport located within the lateral limits on the designated airspace, listening watch should start as soon as appropriate and be maintained until leaving the airspace.

(2) **TIME OF BROADCAST** - A broadcast should be made:

(a) 10 minutes before entering the designated airspace or, for a pilot taking off from an airport located within the lateral limits of the designated airspace, as soon as appropriate:

(b) 10 minutes prior to crossing a reporting point;

(c) 10 minutes prior to crossing or joining an ATS route;

(d) at 20 minute intervals between distant reporting points;

B-20 NATL/INTL FLIGHT DATA/PROCEDURES

- (e) 2 to 5 minutes, where possible, before a change in flight level;
- (f) at the time of a change in flight level; and
- (g) at any other time considered necessary by the pilot.

(3) EXAMPLE OF BROADCAST

- (a) "ALL STATIONS" given only once, to attract attention
- (b) "THIS IS UA" (call sign, for identification)
- (c) "FL 310"
- (d) "SOUTHBOUND BOGOTA/RIO DE JANEIRO VIA UA315" (Direction of Flight through area)
- (e) "POSITION AT (UTC)"
- (f) "ESTIMATING POSITION AT (UTC)"
- (g) "UA" (call sign)
- (h) "FL 310"
- (i) ". . . ." (Direction of Flight through area)

(4) OPERATING PROCEDURES

- (a) Changes of Cruising Level

1. Cruising level changes should not be made within the designated airspace, unless considered necessary by pilots to avoid traffic conflicts, for weather avoidance or for other valid operational reasons.

2. When cruising level changes are unavoidable, all available aircraft lighting which would improve the visual detection of the aircraft should be displayed while changing levels.

- (b) Collision Avoidance

1. If, on receipt of a traffic information broadcast from another aircraft, a pilot decides that immediate action is necessary to avoid an imminent collision risk, and this cannot be achieved in accordance with the right-of-way provisions, the pilot should:

a. unless an alternative maneuver appears more appropriate, immediately descent 1000 if above FL 290, or 500 if at or below FL 290;

b. display all available aircraft lighting which would improve the visual detection of the aircraft;

c. as soon as possible, reply to the broadcast advising action being taken;

d. notify the action taken on the appropriate ATS frequency; and

e. as soon as situation has been rectified, resume normal flight level, notifying the action on the appropriate ATS frequency.

(c) Normal position Reporting Procedures - Normal position reporting procedures should be continued at all times, regardless of any action taken to initiate or acknowledge a traffic information broadcast.

(d) Operation of Transponders - Pilots should ensure that transponder procedures as contained in ICAO PANS OPS Doc 8168 are complied with and in the absence of other directions from ATC, operate the transponder on Mode A and C Code 2000.

NATL/INTL FLIGHT DATA/PROCEDURES B-21

(e) Use of TCAS - TCAS equipped aircraft should have TA/RA mode selected at maximum range.

(5) NEED FOR THE IFBP IN THE LATIN AMERICA/CARIBBEAN REGION - In some FIRs within the Latin America/Caribbean Region, communications both fixed and mobile have either not been implemented or operate well below the required ICAO criteria, giving vent to a poor provision of air traffic services. Consequently, the Latin America/Caribbean Regional Coordinating Group (RCG) has decided that the IATA In-Flight Broadcast Procedure (IFBP) should be used in designated areas and along designated routes (see paragraph Area of Application) as an interim measure until such time as communications facilities affecting the FIRs in question have been implemented and adequate air traffic services are established.

(6) AREA OF APPLICATION - The Latin America/Caribbean RCG has agreed that the In-Flight Broadcast Procedure should be applied in the following FIRs and along the following routes/areas in the region:

(a) Route/FIR

1. Acapulco-Lima route
2. Los Angeles-Santiago route (over uncontrolled areas)
3. ATS route UA323 (between FIR Bogota/Manaus border and 100NM Northwest of Gabriel (SGC)) Amazon area
4. ATS route UA315 (between Jacareacanga (JAC) and Alta Floresta (ATF)) Amazon area
5. ATS route UA317 (between FIR Bogota/Manaus border and Elana) Amazon area
6. ATS route UA317 (between Salsa and Alta Floresta (ATF)) Amazon area
7. ATS route UA300 (between Remil and Nenet) Amazon area
8. ATS route UL306 (between Siros and Puera) Amazon area
9. ATS route UL304 (between Tepim and Tesal) Amazon area
10. ATS route UB681 (25NM before/after crossing ATS route UL306)
11. ATS route UA312 (between Acari and 100NM North of Santarem (STM)) Amazon area
12. ATS route UA312 (between 100NM South of Santarem (STM) and Nelos) Amazon area
13. ATS route UB680 (between Atita and 100 NM North of Moz (MOZ)) Amazon area
14. ATS route UB688 (between 100NM South of Fortaleza (FLZ) and Barreiras (BRR) Recife FIR)
15. Bogota FIR within 100NM from Manaus FIR common boundary (excluding UA301 within Bogota FIR)
16. ATS route UL201 (between Mitu (MTU) and Branc) Amazon area
17. ATS route UA301 (between Leticia (LET) and Porto Velho/La Paz FIRs boundary)

(7) ALL AIRLINES OPERATING IN THE LATIN AMERICA/CARIBBEAN REGION ARE REQUESTED TO:

B-22 NATL/INTL FLIGHT DATA/PROCEDURES

- (a) Ensure that their aircrews are fully briefed on the procedure and area of applicability.
- (b) Ensure that their charts and flight documentation are fully amended to reflect the foregoing.
- (c) Any operator reported to IATA as not applying the procedure is immediately contacted, informed of the procedure and requested to apply it.

NATL/INTL FLIGHT DATA/PROCEDURES B-23

3. OCEANIC AREA COMMON VHF FREQUENCIES

(AFFSA/ICAO ANNEX 10 VOL II)

VHF air to air frequency 123.45 MHz enable aircraft engaged in flights over remote and oceanic areas, out of range of VHF ground stations, to exchange necessary operational information and to facilitate the resolution of operational problems.

B-24 NATL/INTL FLIGHT DATA/PROCEDURES

4. USAF BIRD WATCH CONDITION CODES

(AFFSA/AFFSA FIL)

a. The following terminology has been established for rapid communication of bird activity. Bird locations should be given with the condition code.

(1) Condition SEVERE: Bird activity on or immediately above the active runway or other specific location representing high potential for strikes. Supervisors and aircrews must thoroughly evaluate mission need before conducting operations in areas under condition SEVERE.

(2) Condition MODERATE: Bird activity in locations representing increased potential for strikes. BWC moderate requires increased vigilance by all agencies and supervisors and caution by aircrews.

(3) Condition LOW: Bird activity on and around the airfield representing low potential for strikes.

NATL/INTL FLIGHT DATA/PROCEDURES B-25

5. FAA (FSS) FAST FILE FLIGHT PLAN SYSTEM

(AFFSA/AFFSA FIL)

a. The Direct User Access Terminal (DUAT) service is not formatted to provide flight notification messages to military users or users filing to military installations.

b. Some flight service stations have inaugurated the Fast File Flight Plan System for pilots who already have obtained a weather briefing and desire only to file a flight plan. Pilots may call the discrete telephone numbers listed and file flight plans in accordance with recorded taped instructions. IFR flight plans will be extracted and entered in the appropriate ARTCC computer. VFR flight plans will be retained at the FSS for activation by the pilot. This equipment is designed to automatically disconnect after eight seconds of no transmission, so pilots are instructed to speak at a normal speech rate without lengthy pauses between flight plan elements. Pilots are urged to file flight plans into this system at least 30 minutes in advance of proposed departure.

<u>LOCATION</u>	<u>COMMERCIAL</u>	<u>TOLL FREE</u>
COLORADO Denver	(303) 799-7000	(800) 992-7433
CONNECTICUT Connecticut Area		(800) 972-2269
IDAHO Boise	(208) 343-2515	
ILLINOIS Kankakee Chicago	(815) 935-5761 (312) 626-8266	(800) 992-7433
IOWA Fort Dodge		(800) 992-7433
KANSAS Wichita		(800) 992-7433
LOUISIANA De Ridder		(800) 523-3152
MAINE Bangor		(800) 722-0344
MASSACHUSETTS Bridgeport Burlington		(800) 322-3245 (800) 458-0072/0065
MINNESOTA Princeton	(612) 389-5880	(800) 992-7433
MISSOURI Columbia St. Louis	(573) 443-1410 (636) 441-1130	(800) 992-7433 (800) 992-7433
NEBRASKA Columbus		(800) 992-7433
NEVADA Reno	(702) 858-1300	(800) 992-7433
NEW HAMPSHIRE Bangor		(800) 543-4316
NEW YORK Burlington		(800) 458-0072/0065
NORTH DAKOTA Grand Forks		(800) 992-7433
OKLAHOMA McAlester	(918) 426-4870	(800) 722-4447
RHODE ISLAND Bridgeport		(800) 322-3245

B-26 NATL/INTL FLIGHT DATA/PROCEDURES

<u>LOCATION</u>	<u>COMMERCIAL</u>	<u>TOLL FREE</u>
SOUTH DAKOTA		
Huron	(605) 352-3806	(800) 992-7433
TEXAS		
Metroplex	(817) 429-7761	
Montgomery Co. (Conroe)	(409) 760-4205	
From Area Codes 409 & 713		
VERMONT		
Burlington		(800) 822-9202
WISCONSIN		
Green Bay (Austin Straubel)	(920) 494-7417	(800) 992-7433

GROUND VEHICLE FRICTION CORRELATION CHART										
Nominal Test Speed, 65Km/h (40 mph) ⁹										
GROUND VEHICLE READING										
BRAKING ACTION LEVEL	RCR ¹	DECEL METERS ²	JAMES BRAINKE INDEX ³	MU-METER	SURFACE FRICTION TESTER ⁴	RUNWAY FRICTION TESTER ⁵	BV-11 SKIDDO-METER ⁴	GRIP TESTER ⁶	LOCKED WHEEL DEVICES ⁷	ICAO INDEX ⁸
GOOD	> 17	> 0.53	> 0.58	> 50	> 0.54	> 0.51	> 0.59	> 0.49	> 0.51	5
FAIR	12-17	0.37-0.53	0.40-0.58	0.35-0.50	0.38-0.54	0.35-0.51	0.42-0.59	0.34-0.49	0.37-0.51	3-4
POOR	6-11	0.17-0.36	0.20-0.39	0.15-0.34	0.18-0.37	0.18-0.34	0.21-0.41	0.16-0.33	0.18-0.36	2-3
NIL	≤ 5	≤ 0.16	≤ 0.17	≤ 0.14	≤ 0.16	≤ 0.15	≤ 0.19	≤ 0.14	≤ 0.15	1

NOTES: 1. RCR=Runway Condition Reading=Decelerometer reading x 32

2. Decelerometers include Tapley, Bowmank, and electronic recording decelerometer

3. JBLE-James Brake Index

4. Measurements obtained with grooved aero tire inflated to 690 kPa (100 psi)

5. Measurements obtained with smooth ASTM 4 x 8.0 tire inflated to 210 kPa (30 psi)

6. Measurements obtained with smooth ASTM tire inflated to 140 kPa (20 psi)

7. ASTM E-274 skid trailer and E-503 diagonal-braked vehicle equipped with ASTM E-524 smooth test tires inflated to 170 kPa (24 psi)

8. ICAO=International Civil Aviation Organization

9. A wet runway produces a drop in friction with an increase in speed. If the runway has good texture, allowing the water to escape beneath the tire, then the friction value will be less affected by speed. Conversely, a poorly textured surface will produce a larger drop in friction with increase in speed. Friction characteristics can be further reduced by poor drainage because of inadequate slopes or depressions in the runway surface.
(AFSA/XO1A)

B-28 NATL/INTL FLIGHT DATA/PROCEDURES

6. RUNWAY CONDITION READING (RCR) CORRELATION CHART

(AFFSA/AFFSA)

NOTE: Joint USAF/NASA test have proven RCR measurements invalid where the only form of moisture affecting the runway is water. Readings taken during such conditions will be reported as Wet Runway - WR. Measurements taken when water or slush is present on an ice covered runway will be reported as RCR 12 or the measured decelerometer reading, whichever is lower. If the aircraft flight manual requires a different RCR for WET runways, use the RCR specified in the flight manual.

Runway Condition Reading (RCR)	Percent Increase In Landing Roll
02 to 05	100 or more
06 to 12	99 to 46
13 to 18	45 to 16
19 to 25	15 to 0

a. Runway surface conditions and RCR readings as reported by base operations are appended to hourly aviation weather observations in coded form based on the following:

Wet Runway	WR
Slush on Runway	SLR
Loose Snow on Runway	LSR
Packed Snow on Runway	PSR
Ice on Runway	IR
Patchy conditions (Ice, Snow or water)*	P
Runway Sanded	SANDED

*Code "P" will be used when the runway is less than fully covered by the coded RSC element. After patchy, a wet or dry report will be added to describe the portion of the runway not covered by ice, snow, or slush.

EXAMPLES:

Packed snow on runway; decelerometer reading of 15.	PSR 15
Loose snow on runway; decelerometer reading of 20.	LSR 20
Ice on runway; decelerometer reading of 05. Condition patchy, runway sanded.	IR 05P/SANDED
Ice on runway; decelerometer reading of 05. Condition patchy; remainder of runway wet.	IR 05P/WET

7. WAVE-OFF LIGHTING AT USN/USMC AIRPORTS

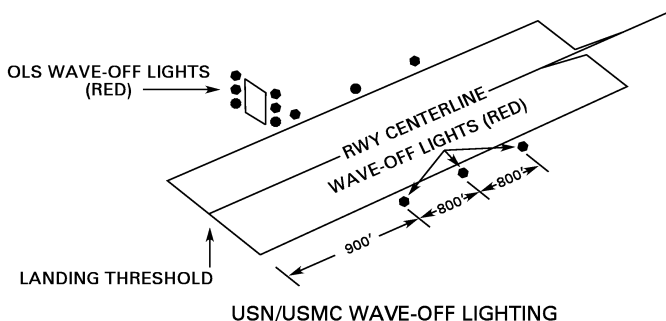
(NAVFIG/NAVFIG)

a. Emergency wave-off or "go around" due to unsafe runway conditions or aircraft configuration (normally wheels-up) may be signaled to aircraft on final approach by red, high intensity lights flashing near the runway touchdown zone.

b. These optical warning systems, when installed, may be activated by the tower controller, Landing Signal Officer (LSO), Runway Duty Officer (RDO), or, in the case of a wheels-up approach, by an enlisted "WHEELS" watch stationed approximately 1000 feet short of the landing runway. All of the preceding have the authority to order a wave-off if, in their judgment, the approach cannot be continued to a safe touchdown and/or roll-out. Such wave-off signals are mandatory unless the pilot is experiencing an emergency.

c. In addition to the foregoing, radio, red flares, hand/flag or standard ATC Aldis lamp signals may be used either individually or in combination to indicate wave-off. Normally, radio and/or Aldis lamp in addition to the flashing red lights, are used when wave-off is initiated by the tower controller.

d. Red wave-off lights are installed integrally with the Optical Landing System (OLS) used for visual glide slope information and/or along each side of the runway extending to 2500 feet from the threshold. When these lights are activated, pilots should execute an immediate wave-off and contact the tower for further clarification and instructions.



B-30 NATL/INTL FLIGHT DATA/PROCEDURES

8. PILOT CONTROL OF AIRPORT LIGHTING

(AIM)

a. Standard FAA approved radio-controlled lighting systems consist of various combinations of approach or runway lights activated by a 3-step control responsive to 7, 5, and/or 3 microphone clicks in 5 seconds. This 3-step control will turn on lighting facilities capable of either 3-step, 2-step, or 1-step operation. The 3-step and 2-step lighting facilities can be altered in intensity while the 1-step cannot. All lighting facilities which are radio controlled at an airport, whether on a single runway or multiple runways, operate on the same radio frequency and are illuminated for a period of 15 minutes from the most recent time of activation. Lighting facilities may not be extinguished prior to the end of the 15 minutes, except for the 1-step and 2-step REIL, which may be turned off when desired by keying the microphone 5 or 3 times respectively.

b. The DoD Enroute Supplement, Airport/Facility Listing contains information on the type of lighting, runway, and frequency used to activate the system. Examples: Service - Lgt - 3 step apch lgt Rwy 09-27; Service - Lgt - 2 step VASI and ODALS Rwy 13 - 123.0; Service - Lgt - ACTIVATE - HIRL Rwy 06-24 - 122.8.

c. The suggested method of operation is to always key the microphone 7 times. This will ensure all lights are on to the maximum intensity. If desired, intensity can be adjusted, where the capability is provided, to a lower intensity (or REIL turned off) by keying the microphone 5 and/or 3 times. Due to possible close proximity of airports using the same radio-control lighting frequencies, radio-controlled lighting receivers may be set at a low sensitivity requiring the aircraft to be relatively close to the airport to activate the system. Even if the lighting facilities are on upon arrival, key the microphone to ensure a full 15 minute separation.

d. At airports with other than FAA approved system, the type lights, method of control, and operating frequency will be in clear text.

e. Lighting facilities may be activated by the radio control system by keying the microphone as shown below:

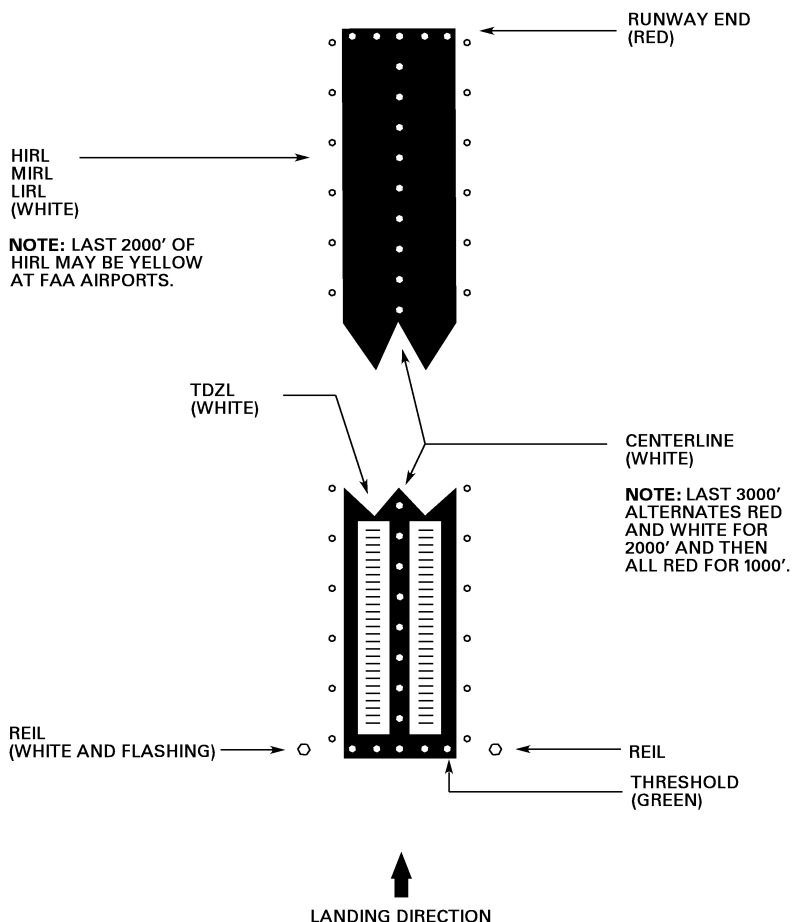
SYSTEM	KEY MICROPHONE	INTENSITY
3-step	7 times in 5 seconds	High
	5 times in 5 seconds	Medium
	3 times in 5 seconds	Low
*2 step	7 times in 5 seconds	High
	3 times in 5 seconds	Low
2-step REIL	3 times in 5 seconds	OFF
ACTIVATE (1-step) (HIRL, MIRL, LIRL, VASI or REIL)	5 times in 5 seconds	ON
1-step REIL	5 times in 5 seconds	OFF

*Activate to High intensity before selecting Medium Intensity

LEGEND INSTRUMENT APPROACH PROCEDURES (CHARTS) LIGHTING SYSTEMS

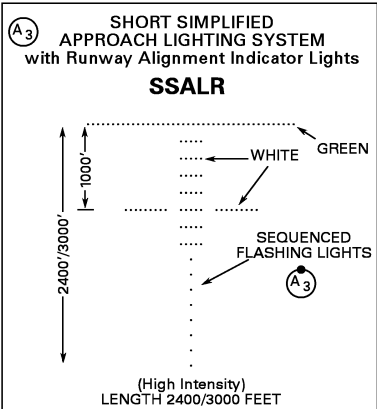
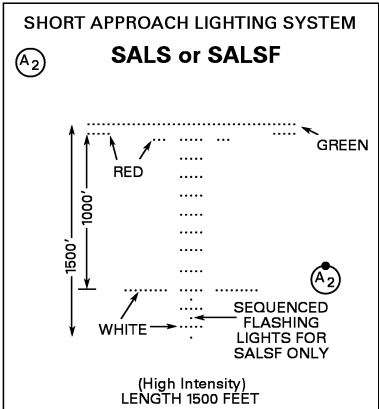
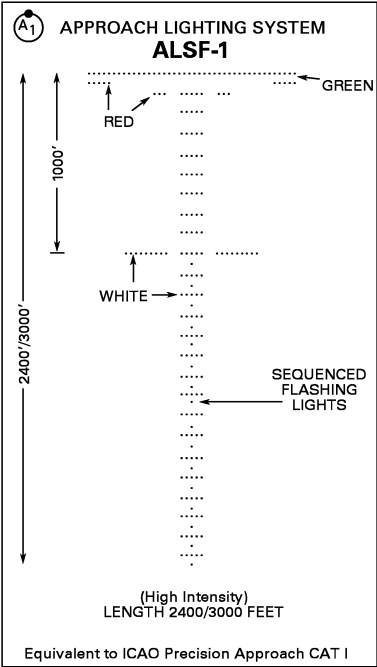
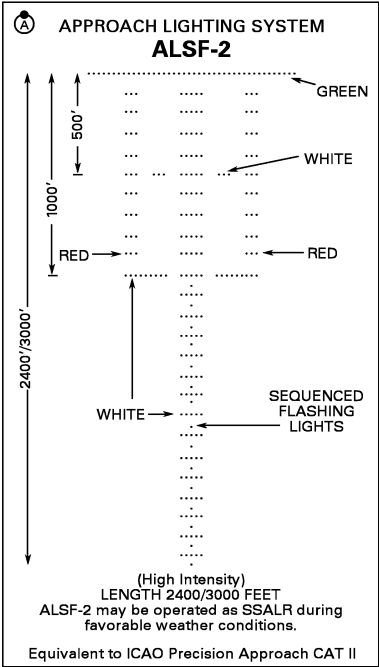
Lighting systems are presented in three sections; runway lighting, approach lighting and visual glide slope indicators. Availability of runway lighting will be shown by note in the airport sketch, e.g. TDZL/CL Rwy 15. Approach lighting and visual glide slope indicators are indicated on the airport sketch by a system identification, e.g. ^(A2) Lighting system depictions show typical configurations. Variations can exist. For more information see GP, Chap 2, Airport Lighting.

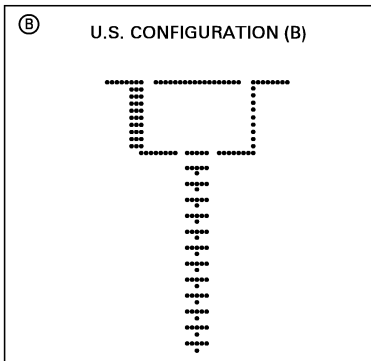
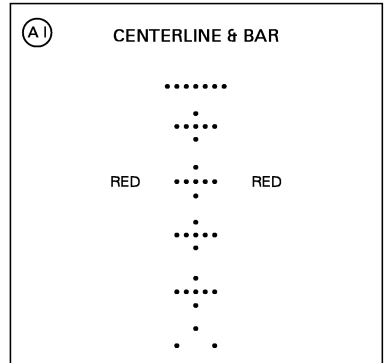
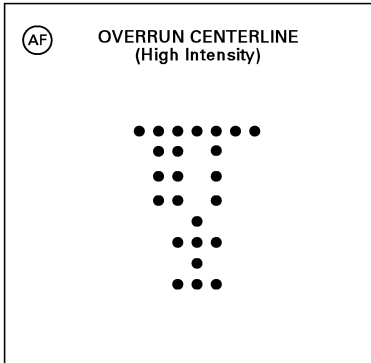
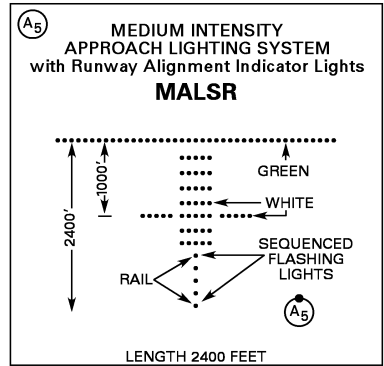
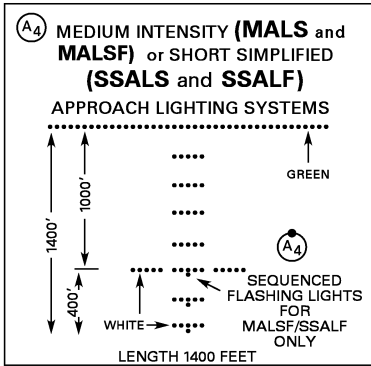
RUNWAY LIGHTING SYSTEMS



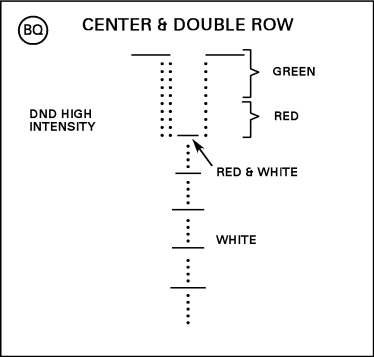
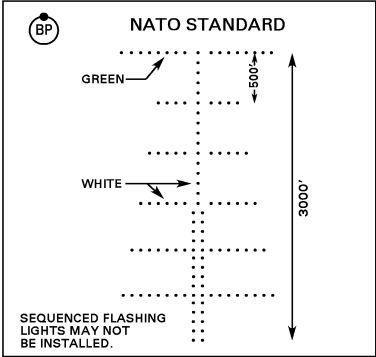
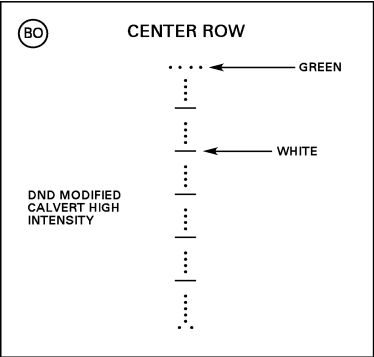
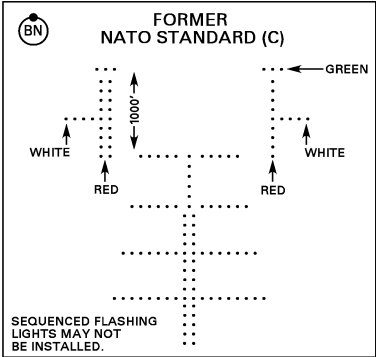
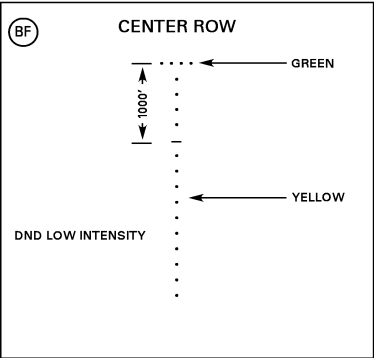
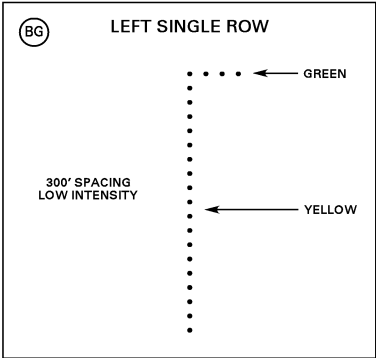
APPROACH LIGHTING SYSTEMS

A dot "•" portrayed with approach lighting letter identifier indicates sequenced flashing lights (F) installed with the approach lighting system, e.g. A₁. Negative symbology, e.g., A₁, A₂ indicates Pilot Controlled Lighting (PCL).

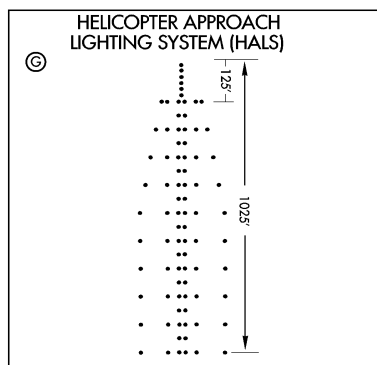
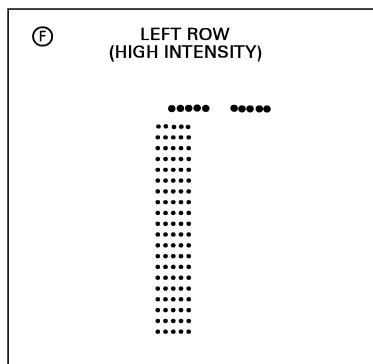
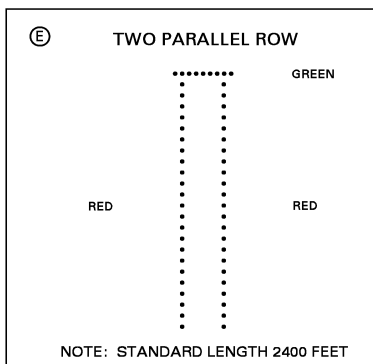
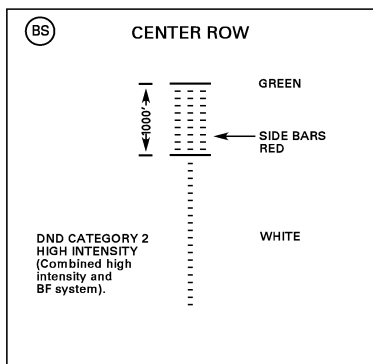
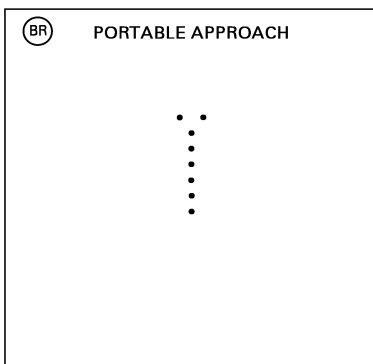




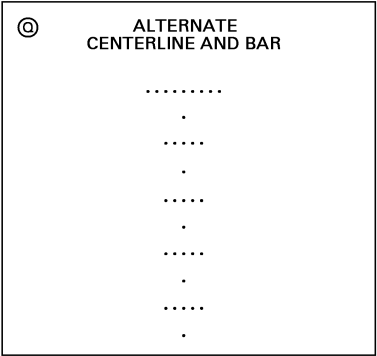
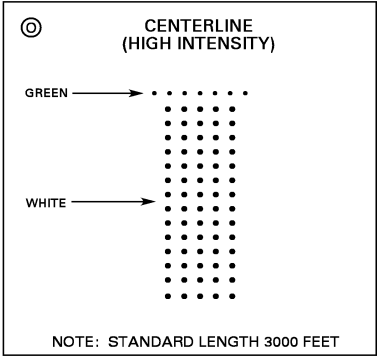
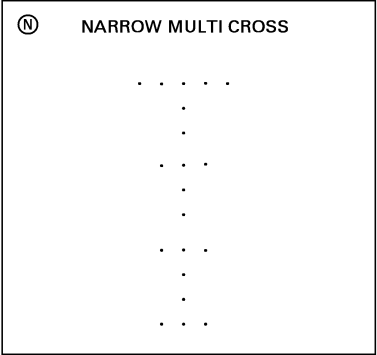
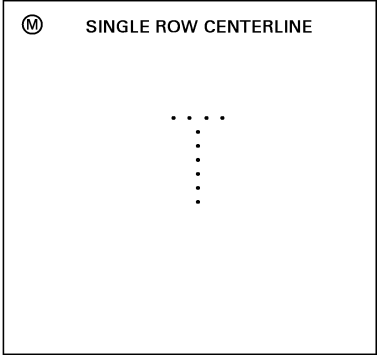
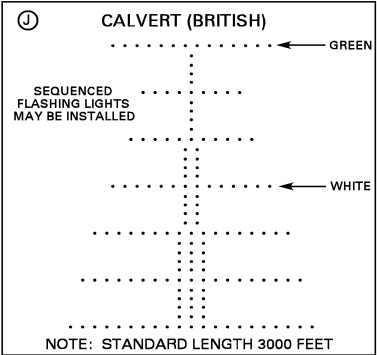
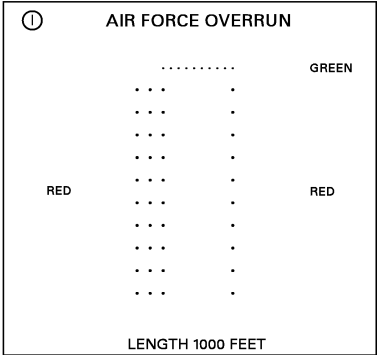
B-34 NATL/INTL FLIGHT DATA/PROCEDURES



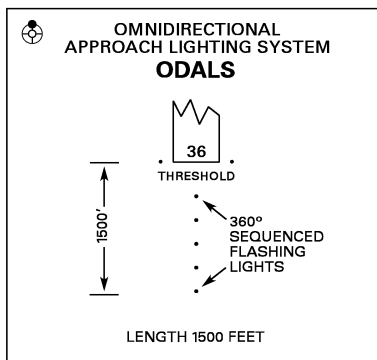
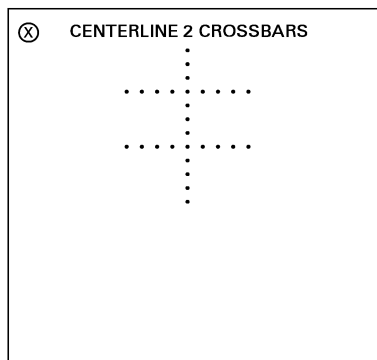
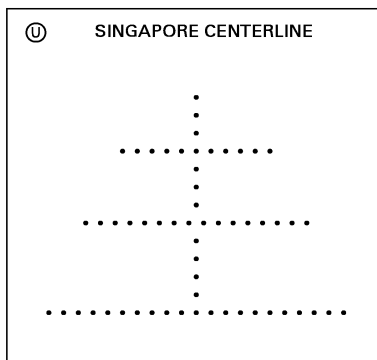
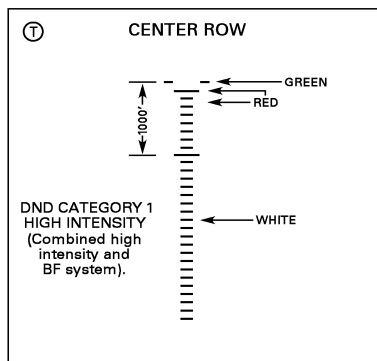
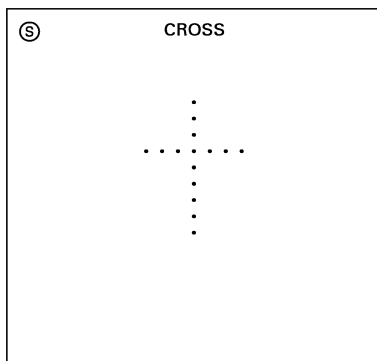
NATL/INTL FLIGHT DATA/PROCEDURES B-35



B-36 NATL/INTL FLIGHT DATA/PROCEDURES



NATL/INTL FLIGHT DATA/PROCEDURES B-37



VISUAL GLIDE SLOPE INDICATORS

P

PRECISION APPROACH
PATH INDICATOR
PAPI

Too low Slightly low

On correct
approach path

Slightly high Too high

Legend: □ White ■ Red

V1

"T" - VISUAL APPROACH
SLOPE INDICATOR

"T" - **VASI**

"T" on both sides of Rwy.
All lights variable white.
Correct approach slope -
only cross bar visible.
Upright "T" - fly up
Inverted "T" - fly down
Red "T" - gross undershoot

V

VISUAL APPROACH
SLOPE INDICATOR
VASI

VISUAL APPROACH SLOPE INDICATOR WITH
STANDARD THRESHOLD CLEARANCE PROVIDED.

ALL LIGHTS WHITE - TOO HIGH
FAR LIGHTS RED, NEAR LIGHTS WHITE -
ON GLIDE SLOPE
ALL LIGHTS RED - TOO LOW

THRESHOLD THRESHOLD THRESHOLD

V2

PULSATING VISUAL APPROACH
SLOPE INDICATOR
PVASI

PULSE LIGHT APPROACH SLOPE INDICATOR
HELI-PLASI

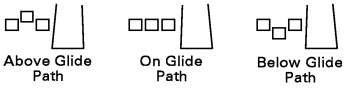
Above Glide Path Pulsating White
On Glide Path Steady White
Slightly Below Glide Path Steady Red
Below Glide Path Pulsating Red

CAUTION: When viewing the Approach
Slope Indicator in the pulsating white or pulsating
red sector, it is possible to mistake this lighting aid
for another aircraft or a ground vehicle.
Pilots should exercise caution when using this
type of system.

ALIGNMENT OF ELEMENTS SYSTEMS

(V5)

APAP

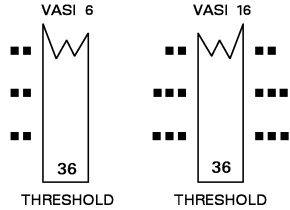


Painted panels which may be lighted at night. To use the system the pilot positions the aircraft so the elements are in alignment.

(V3)

VISUAL APPROACH SLOPE INDICATOR VASI

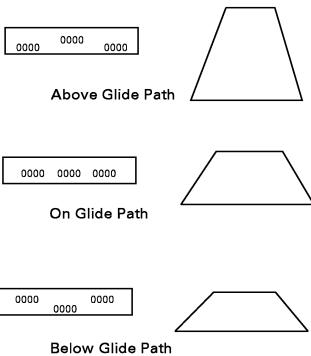
VISUAL APPROACH SLOPE INDICATOR WITH A THRESHOLD CROSSING HEIGHT TO ACCOMMODATE LONG BODIED OR JUMBO AIRCRAFT.



(V)

LOW COST VISUAL APPROACH SLOPE INDICATOR

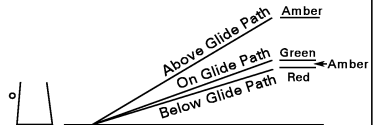
LCVASI



CAUTION: Visual references from the LCVASI are different from standard VASI. See GP, para. 5 for details.

(V4)

TRI-COLOR VISUAL APPROACH SLOPE INDICATOR



CAUTION: When the aircraft descends from green to red, the pilot may see a dark amber color during the transition from green to red.

B-40 NATL/INTL FLIGHT DATA/PROCEDURES

9. CIRVIS REPORTS

(AFFSA/AFMAN 10-206, NORADR 55-1)

a. CIRVIS (pronounced SUR VEES) reports are reports of information of vital importance to the security of the United States and Canada and their forces, which in the opinion of the observer, require very urgent defensive and/or investigative action by the US and/or Canadian Armed Forces.

b. CIRVIS reports should be transmitted in plain language, as soon as possible, to any available US or Canadian military or civil air/ground communications facility. Reporting procedures will be similar to those used when transmitting position reports except the call will be preceded by the word CIRVIS spoken three times to clear the frequency(ies) over all other communications, except DISTRESS and URGENCY. If this fails to clear the frequency(ies), the International Urgency Signal "XXX" transmitted three times or "PAN PAN" spoken three times will be employed.

c. Additional CIRVIS reports should be made if more information on the sighting becomes available. These should contain a reference to the original report.

d. A CANCELLATION report should be made in the event a previously reported sighting is positively identified as friendly or that it has been erroneously reported.

e. **REPORT IMMEDIATELY BY RADIO:**

(1) Hostile or unidentified single aircraft or formation of aircraft which appear to be directed against the United States, Canada or their forces.

(2) Missiles.

(3) Unidentified flying objects.

(4) Hostile or unidentified group(s) of military surface vessels.

(5) Hostile or unidentified submarines.

(6) Individual surface vessels, submarines, or aircraft of unconventional design, or engaged in suspicious activity or observed in an unusual location or on a course which may be interpreted as constituting a threat to the United States, Canada or their forces.

(7) Any unexplained or unusual activity which may indicate a possible attack against or through the United States or Canada, including the presence of any unidentified or suspicious ground parties in the Polar region or other remote or sparsely populated areas.

f. **UPON LANDING:**

(1) Reports which for any reason could not be transmitted while airborne.

(2) Unlisted airfields, facilities, weather stations or air navigation aids.

(3) Post landing reports (to include as many photographs as are obtained).

g. **DO NOT REPORT** craft or aircraft in normal passage or known U.S. or Canadian military or government vessels (including submarines) and aircraft.

NATL/INTL FLIGHT DATA/PROCEDURES B-41

10. JOINT SPECTRUM INTERFERENCE RESOLUTION (JSIR) PROCEDURES

(AFFSA/XOIA FIL 2-10)

a. Each operator of electromagnetic equipment is responsible for reporting JSIR incidents in a timely manner.

b. The following perishable information should be recorded at the time of the incident:

- (1) True course, ground speed, and altitude (MSL).
- (2) Weather conditions.
- (3) Date/Time(Z)/Coordinates JSIR began.
- (4) Date/Time(Z)/Coordinates JSIR most effective.
- (5) Date/Time(Z)/Coordinates JSIR ended.
- (6) Bearing(s) to JSIR source with corresponding times (Z) and victim coordinates.
- (7) Frequency(ies) affected.
- (8) Call signs/type aircraft/audio characteristics/scope presentations, etc noted.

c. JSIR reports may be transmitted in flight if a secure communications mode is available; otherwise, report should be delayed until it can be transmitted via secure means.

d. For detailed JSIR information and guidance refer to AFI 10-707; AR 5-12; OPNAVINST C3430.18A or MCO 03430.3.

NOTE: See FIH (Section B) USAF Global Communications System - HF Manager for additional information on services provided.

B-42 NATL/INTL FLIGHT DATA/PROCEDURES

11. POLLUTION REPORT (POLREP) FORMAT

(USCG/G-OAV)

a. Pilots are requested to volunteer reports of water pollutants (oil, chemicals, dye, etc.) including size and source of the pollution, on-scene weather, and other significant information. The POLREP should be transmitted to the U.S. Coast Guard National Response Center (NRC), fone 800-424-8802 or 202-267-2675 via any available communications facility.

b. Pollution reports should be made anytime pollution is sighted within 200 nautical miles of the U.S. shoreline, on the Great Lakes, or within 50 nautical miles of any nation in the Wider Caribbean Region.

c. POLREP FORMAT

(1) Pollutant (oil, chemical, dye, etc.)

(2) Size of slick/polluted area (meters, yards, miles)

(3) Condition and color of pollutant (solid - streaked - windrows - fragmented; black - orange - brown - silvery sheen - iridescent sheen)

(4) Location (Lat/Long or radial/DME)

(5) Time discovered (UTC)

(6) Direction of movement (length axis)

(7) Source (course, speed, name (if vessel))

(8) On-scene weather (wind speed, direction, sea state, visibility, percent cloud cover)

(9) Altitude at which sighting made

(10) Identification and parent command of reporting source

(11) If known, any incident report number previously assigned by the NRC concerning the pollution incident being reported.

NATL/INTL FLIGHT DATA/PROCEDURES B-43

12. USAF HIGH FREQUENCY GLOBAL COMMUNICATIONS SYSTEM (HF-GCS)

(AFFSA/AFFSA)

a. **GENERAL** - The HF-GCS System is a worldwide network of 15 high-power HF stations providing air/ground HF command and control radio communications between ground agencies and US military aircraft and ships. Allied military and other aircraft are also provided support IAW agreements and international protocols as appropriate. The HF-GCS is not dedicated to any service or command, but supports all DoD authorized users on a traffic precedence/priority basis. General services provided by the HF-GCS are:

- General Phone Patch and Message Relay Services
- Automatic Link Establishment (ALE)
- HF Data Support
- Command and Control Mission Following
- Emergency Assistance
- Broadcasts
- HF Direction Finding Assistance
- ATC Support
- E-Mail connectivity to NIPRNeT and SIPRNeT

b. **MODERNIZATION** - SCOPE Command replaces older high power Global HF equipment. SCOPE Command incorporates Automatic Link Establishment (ALE) to automate communications. All HF-GCS station transmit and receive equipment is remotely controlled from the Centralized Net Control Station (CNCS) at Andrews AFB MD.

c. PROCEDURES -

(1) General Calling. Aircrews use a preliminary call as outlined in ACP-121 US Supp 2 using the collective callsign "MAINSAIL" or the HF-GCS station call sign (example: Sigonella Global this is Dark 86 on 11175, OVER). HF-GCS operators require approximately 10 seconds (for automated equipment configuration) to respond to calls for service. The HF-GCS operator may request the aircraft change to a discrete frequency for improved and/or extended service.

(a) PUBLISHED FREQUENCY LISTING - HF-GCS stations operate on "core" frequencies to provide increased "Global" coverage. The published frequency listing does not reflect complete system frequency authorizations. These published frequencies will be used for initial contact, EAM broadcasts, and short term C2 phone patch and message delivery. Other extended or special services will be moved to each station's available "discrete" frequencies.

(b) FREQUENCY GUIDE - The frequency guide is designed to optimize air/ground communications.

Primary HF-GCS Frequencies - 24 hours 8992 11175

Back up HF-GCS Frequencies - DAY 13200 15016

Back up HF-GCS Frequencies - NIGHT 4724 6739

TIME (2)	DISTANCE (1)		
	200-7500 NM	750-1500 NM	More than 1500 NM
0000L	4724	6712/6739/8992	6712/6739/8992/11175
0400 L	4724	4724 /6712/6739	6712 /6739 /8992
0800 L	4724/6712/6739	6712/6739/8992/11175	11175/13200/15016
1200 L	4724/6712/6739	8992/11175/13200	13200/15016
1600 L	4724/6712/6739	8992/11175/13200	13200/15016
2000 L	4724/6712/6739	6712/6739/8992/11175	1175/13200/15016

1. When less than 200 NM any frequency may be used.

2. Local time at ground station

B-44 NATL/INTL FLIGHT DATA/PROCEDURES

FREQUENCIES - SUMMER (Apr-Sep)							
STATION	4724	6712	6739	8992	11175	13200	15016
Andrews	0430-0930Z	0230-0930Z		24 hours	24 hours	0930-0230Z	0930-0230Z
Ascension	2400-0700Z		1900-2400Z	24 hours	24 hours		0700-1900Z
Croughton	2230-0400Z	2230-0400Z		24 hours	24 hours	0400-2230Z	0400-2230Z
Diego Garcia				24 hours	24 hours		
Elmendorf	1000-1300Z		0800-1400Z	24 hours	24 hours	1300-1000Z	1400-0800Z
Guam	1300-2000Z		1100-2000Z	24 hours	24 hours	2000-1300Z	2000-1100Z
Hawaii	1000-1600Z		0500-1000Z	24 hours	24 hours		1600-0500Z
Keflavik	2200-0530Z		2200-0730Z	24 hours	24 hours	0530-2200Z	0730-2200Z
Lajes	2230-0400Z			24 hours	24 hours	24 hours	0400-2230Z
McClellan	0730-1300Z		0530-1300Z	24 hours	24 hours	1300-0730Z	1300-0530Z
Offutt	0600-1100Z		0400-1100Z	24 hours	24 hours	1100-0600Z	1100-0400Z
Puerto Rico	0300-1000Z		0100-1000Z	24 hours	24 hours	1000-0300Z	1000-0100Z
Sigonella	2230-0400Z		24 hours	24 hours	24 hours	24 hours	0400-2230Z
Yokota	1200-1930Z		1000-2130Z	24 hours	24 hours	1930-1200Z	2130-1000Z

FREQUENCIES - WINTER (Oct-Mar)							
STATION	4724	6712	6739	8992	11175	13200	15016
Andrews	0200-1230Z	2400-1230Z		24 hours	24 hours	1230-0200Z	1230-2400Z
Ascension	2400-0700Z		1900-2400Z	24 hours	24 hours		0700-1900Z
Croughton	1800-0800Z	1800-0800Z		24 hours	24 hours	0800-1800Z	0800-1800Z
Diego Garcia				24 hours	24 hours		
Elmendorf	0230-1900Z		0030-2130Z	24 hours	24 hours	1900-0230Z	2130-0030Z
Guam	1200-2030Z		1000-2030Z	24 hours	24 hours	2030-1200Z	2030-1000Z
Hawaii	0800-1700Z		0400-0800Z	24 hours	24 hours		1700-0400Z
Keflavik	2000-0800Z		2000-1000Z	24 hours	24 hours	0800-2000Z	1000-2000Z
Lajes	1800-0800Z			24 hours	24 hours	24 hours	0800-1800Z
McClellan	0500-1530Z		0300-1530Z	24 hours	24 hours	1530-0500Z	1530-0300Z
Offutt	0300-1400Z		0100-1400Z	24 hours	24 hours	1400-0300Z	1400-0100Z
Puerto Rico	0200-1100Z		2400-1100Z	24 hours	24 hours	1100-0200Z	1100-2400Z
Sigonella	1800-0800Z		24 hours	24 hours	24 hours	24 hours	0800-1800Z
Yokota	0930-2200Z		0730-2400Z	24 hours	24 hours	2200-0930Z	2400-0730Z

(2) Unclassified Phone Patch and Message Relay Services

(a) Phone Patch Service. Phone patching allows direct voice communications between ground agencies and aircraft by electronically connecting telephone circuits to radio transmitters and receivers. Phone patch service is reserved for official unclassified business only and shouldn't exceed 5 minutes. Patches of more than 5 minutes or of a sensitive nature should be run on a discrete frequency. Aircrews requesting a phone patch must include all information necessary for HF-GCS operators to complete the call, such as the identity or location of the called parties and telephone number if known. Phone patches are monitored by HF-GCS operators and if radio reception isn't of sufficient quality to complete the patch, they will attempt to copy the traffic and relay it to addressees.

(b) Message Relay Service. HF-GCS operators transcribe encoded or plain-text messages for aircraft or ground stations and forward them to the addressees by radio or landline. The text of the messages can be in the form of alphanumerics, code words, plain text, acronyms, and/or numerical sequences. Aircrews may use "READ BACK" procedures when the message data is critical, or when an incomplete transmission is suspected due to poor radio reception. All messages received by Global stations will be accepted and delivered by the fastest means available according to precedence and priority.

NATL/INTL FLIGHT DATA/PROCEDURES B-45

(c) **ALE** - For ALE radios to operate properly, the radio must have a loaded datafill, be turned on in the "automatic" mode and remain there the duration of the flight. If the radio is removed from the ALE mode, history tables will require time to rebuild and initial communications may be slightly degraded.

ALE Address and Frequency Chart											
Station	ALE					Frequency					
	Address	3137	4721	5708	6721	9025	11226	13215	15043	18003	23337
Andrews	ADW	x	x	x	x	x	x	x	x	x	x
Ascension	HAW	x	x		x	x	x	x	x	x	x
Croughton	CRO	x	x		x	x	x	x	x	x	x
Diego Garcia	JDG	x	x	x	x	x	x	x	x	x	x
Elmendorf	AED	x	x	x	x	x	x	x	x	x	x
Guam	GUA	x	x	x	x	x	x	x	x	x	x
Hawaii	HIK	x	x		x	x	x	x	x	x	x
Keflavik	IKF	x	x	x	x	x	x	x	x	x	x
Lajes	PLA	x	x	x	x	x	x	x	x	x	x
McClellan	MCC	x	x	x	x	x	x	x	x	x	x
Offutt	OFF	x	x	x	x	x	x	x	x	x	x
Salinas	JNR	x	x	x	x	x	x	x	x	x	x
Sigonella	ICZ	x	x	x	x	x	x	x	x	x	
South Atlantic	MPA	x	x	x	x	x	x	x	x	x	x
Yokota	JTY	x	x		x	x	x	x	x	x	

(d) **HF Data Service.** All HF-GCS stations have HF data access to AUTODIN and SACCS. HF Radio Teletype requirement has been removed by Joint Staff J6.

(e) **Command and Control Mission Following.** C2 agencies can use the HF-GCS for mission tracking/control of their aircraft. Aircraft responsible to a C2 agency for mission tracking/control should transmit an initial contact/departure report to a Global HF System station after takeoff. The following information should be included:

- Aircraft Call Sign
- Departure point and time
- Destination point and ETA
- Relay Instructions for C2 Agencies
- Remarks: DV codes, special instructions, etc.

d. EMERGENCY ACTION MESSAGE (EAM) BROADCASTS - Most HF-GCS stations transmit high priority EAMs on published frequencies during specific broadcast periods. During EAM broadcast periods, aircraft may only transmit In-Flight Emergency traffic.

e. EMERGENCY ASSISTANCE - Distress and urgency situations should be clearly identified by the words "MAYDAY" or "PAN" as appropriate (refer ACP 121 US Supp 2, Ch 8 for definitive usage). Aircrews should transmit present position and heading when encountering grave or serious emergency situations.

f. HF DIRECTION FINDING (D/F) ASSISTANCE - HF-GCS stations are capable of coordinating D/F efforts between aircraft and direction finding facilities for both emergency situations and suspected spectrum interference location efforts.

(1) **Emergency D/F Requests.** Aircraft requiring D/F support should advise the HF-GCS station of the nature of the emergency, a bearing (steer) or a position (fix). The HF-GCS operator will arrange the support and ask the aircraft to transmit a slow count from 1 to 10 and back, followed by the aircraft call sign. The aircraft should then standby for further instructions and/or results of the service. D/F facility response time will vary, depending on operating conditions, location of the aircraft, nature of request, prevailing DF facility operating commitments, type of D/F facility providing the service and coordination of all concerned. The average response time is estimated at four minutes for bearings and ten minutes for positions after the slow count.

B-46 NATL/INTL FLIGHT DATA/PROCEDURES

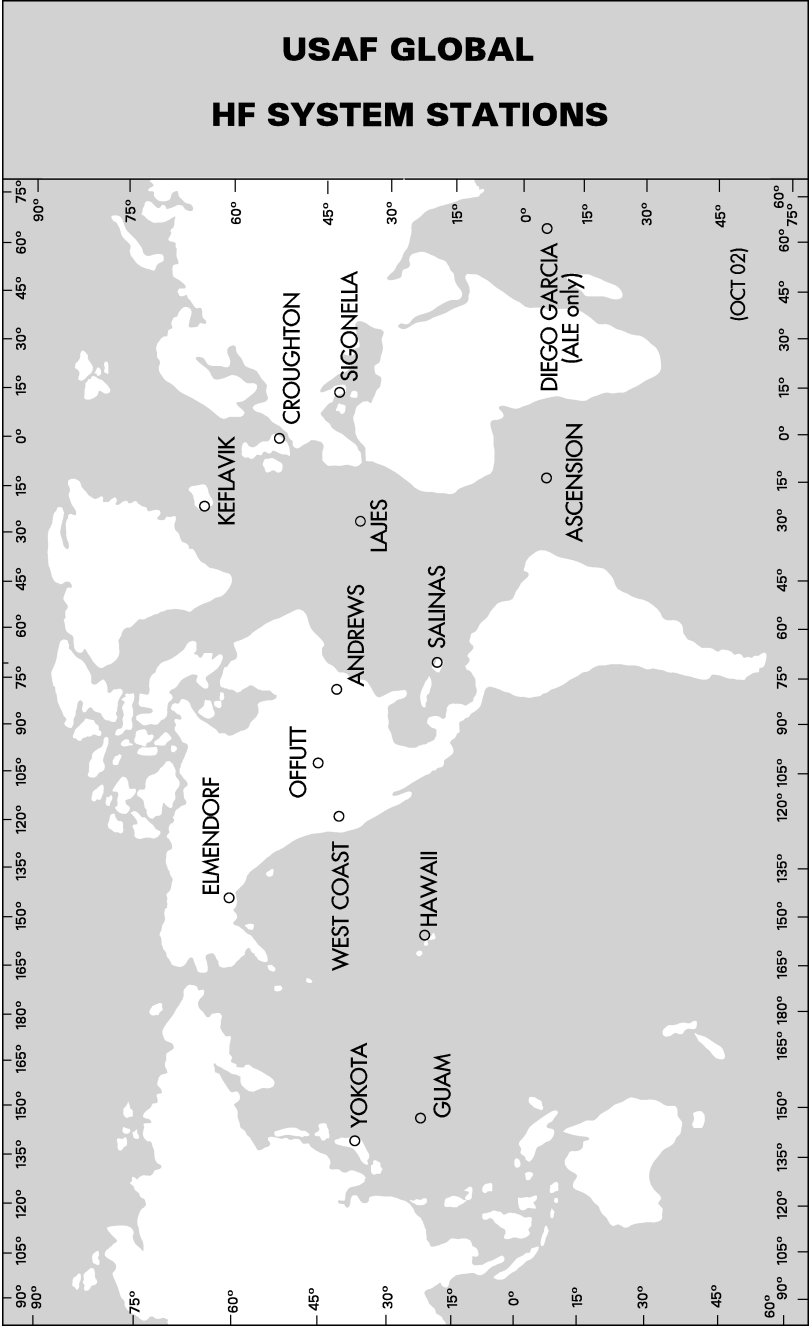
(2) DF Support for Suspected Spectrum Interference. Aircraft experiencing spectrum interference may obtain D/F fix information on source of interference by calling the nearest HF-GCS station and requesting Spectrum Interference D/F support. The aircraft will advise the Global stations of the frequency affected, type of interference (Voice, Morse Code, Printer, Noise, etc.) and request a read-back of the information passed. A report will be filed in accordance with AFI 10-707 by the aircrew upon landing. The Andrews CNCS will report Spectrum Interference D/F results via message to the AF Frequency Management Agency and the aircraft unit command post.

g. **ATC SUPPORT** - HF-GCS is not configured to meet ATC communications routing requirements and cannot provide ATC flight following service. This service can be obtained through the appropriate Civil/ICAO ATC communications agency such as the AREA CONTROL CENTER, SECTOR RADIO, or FLIGHT INFORMATION CENTER (see section B, ICAO HF Aeronautical Station List). Global HF stations will accept emergency ATC traffic and provide phone patch or message relay support as required.

h. **Points of Contact:**

(1) System Management - Questions or feedback concerning service or system access should be addressed to HQ AFCA/GCWM, 203 W. Losey St. RM 2110, Scott AFB, IL 62225-5222, DSN 779-5959/5960, COMM 618-229-5959/5960.

(2) CNCS Operations – For immediate HF assistance, contact the 789 CS, Andrew AFB, MD at DSN 858-3109/5333 or Comm 301-981-3109/5333.



B-48 NATL/INTL FLIGHT DATA/PROCEDURES

i. **AMC OPERATIONS CENTER** - The USAF Air Mobility Command (AMC) Tanker Airlift Control Center (TACC) provides worldwide C2 for AMC missions, while the appropriate theater Air Mobility Control Center (AMCC) provides C2 for theater operated missions. Either the TACC or appropriate AMCC can be contacted for airlift movement reporting and/or assistance directly through the Global stations. The voice call sign "MAINSAIL" may be used for establishing initial contact. Following initial contact, aircrews may request a phone patch to the desired center as follows:

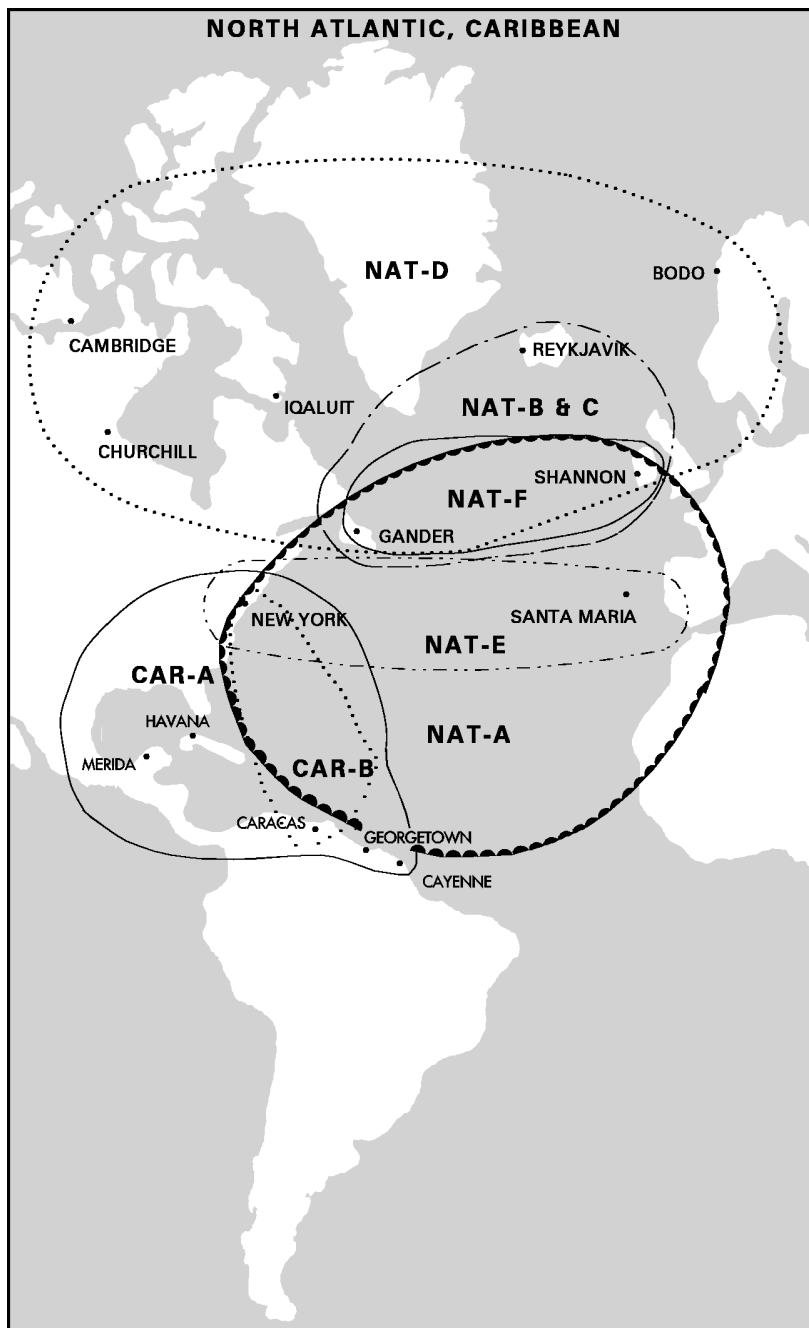
<u>CENTER</u>	<u>CALL SIGN</u>	<u>PRIMARY DSN NUMBER</u>	<u>SECONDARY DSN NUMBER</u>
Elmendorf AMCC	DENALI	317-552-3258	317-552-3439
Osan AMCC	BRICKWALL	315-784-6500	315-784-4950/4600
TACC East Cell	HILDA EAST	312-779-0348	SEE NOTE
TACC West Cell	HILDA WEST	312-779-0349	SEE NOTE
USAFE UTRACC	TRACKER	314-480-9292	314-480-7114/9293

NOTE: The TACC Cell may be called toll-free using 1-800-247-6625 (AIR-MOBL).

The Air Force Eastern Test Range (AFETR) HF Network may be used as a backup to GLOBAL. They may be contacted on USB 10780 (primary) and 20390 (secondary). Their call sign is CAPE RADIO.

j. **ICAO HF AERONAUTICAL STATION LIST**

The ICAO HF aeronautical stations and selected extended range VHF stations contained in this list are extracted from the ICAO Aeronautical Regional Plans and other sources. The listing is to be used as a guide for flight information communications. All the HF stations listed are known to have SSB capability unless otherwise indicated. VHF extended range radio frequencies are shown in parenthesis. Not all stations operate on all frequencies at all times. Regional boundaries shown on the graphic pages represent areas of coverage for frequencies listed. Cities are shown for orientation purposes only.



B-50 NATL/INTL FLIGHT DATA/PROCEDURES

NORTH ATLANTIC, CARIBBEAN

NORTH ATLANTIC (NAT-A)

CANARIES -				
2962①	6628	8906	11309②	17946②
CAYENNE -				
3023	5440	5526	5540	8825
11291	13297			
GANDER				
3016④⑤	5598④⑤	8906④⑤	13306④⑤	
GEORGETOWN -				
6730.5	8855	10096		

LISBOA (127.9)

NEW YORK (129.9)				
SATCOM VOICE 436623③				
3016	5598	8906	13306	17946
PIARCO -				
2887	2910	5526	6577	8825
8855	8918	10096	11387	13297

SANTA MARIA (127.9)				
3016	5598	8906	13306	

SHANWICK (127.9)				
3016	5598	8906	13306	17946

①SS-SR. ②SR-SS. ③631-244-2492. ④0030 - 0830Z++. ⑤1130-1930Z++.

NAT-B

GANDER				
2899	5616	8864	13291	
REYKJAVIK (127.85)(126.55)				
2899	5616	8864	13291	

SHANWICK (127.9)				
2899	5616	8864	11279	13291
17946				

NAT-C

GANDER				
2872	5649	8879	11336	13306
REYKJAVIK (127.85)(126.55)				
2872	5649	8879	13306	

SHANWICK (127.9)				
2872	5649	8879	11336	13306
17946				

NAT-D

BODO -				
2971	4675	8891	11279	

CAMBRIDGE BAY -				
2971	4675	8891	11279	

CHURCHILL (126.9) ①				
2971	4675	8891		

GOOSE (126.9)

IQALUIT (126.9)				
2971	4675	8891	11279	

MONTREAL/DORVAL (126.9)①②				
2971	4675	8891	11279	

REYKJAVIK (127.85)(126.55)				
2971	4675	8891	11279	13291
17946				

SHANWICK (127.9)				
2971	4675	8891	13291	17946

WINNIPEG (126.9)①

①SELCAL. ②N63°45' W68°33'

NAT-E

NEW YORK (129.9)				
SATCOM VOICE 436623①				
2962	6628	8825	11309	13354

SANTA MARIA (127.9)				
2962	6628	8825	11309	17946

①631-244-2492.

NAT-F

GANDER (122.375)①②⑥ (126.9)①⑥				
(127.1)②⑥ (127.9)③⑥ 3476④⑤ 6622④⑤				
8831④⑤	13291④⑤			

SHANWICK (127.9)				
3476	6622	8831	13291	17946

①South ②North. ③N58°-62° AND W40°-50'. ④0030-0830Z++. ⑤1130-1930Z++. ⑥SELCAL.

CARIBBEAN ATLANTIC (CAR-A)

BARRANQUILLA -				
2887	6577	8918	11387	

CARACAS/MAIQUETIA (130.6)				
5550	6577	8918	13297	

GUATEMALA (126.9)				
2887	5550	6577	8918	11396
13297				

NATL/INTL FLIGHT DATA/PROCEDURES B-51

HAVANA (126.9)
2887 5550 6577 8918 11396
13297

MERIDA
2887 5550 6577 8918 11396
13297 17907

NEW YORK (130.7)
SATCOM VOICE 436623①
2887 5550 6577 8918 11396
13297

PANAMA (123.6)
5520 6577 8918 11396

PARAMARIBO
8855

PIARCO -
5526 6577 8825
8855 8918 10096 11387 13297

SAN ANDRES -
2887 3455 6577 6586 8846
8918 11387

SAN JOSE/EL COCO
2887 5550 6577 8918 11396
13297

TEGUCIGALPA (126.9)
2887 5550 6577 8918 11396
13297

①631-244-2492.

CARIBBEAN ATLANTIC (CAR-B)

CAYENNE -
3023 5440 5526 5540 8825
11291 13297

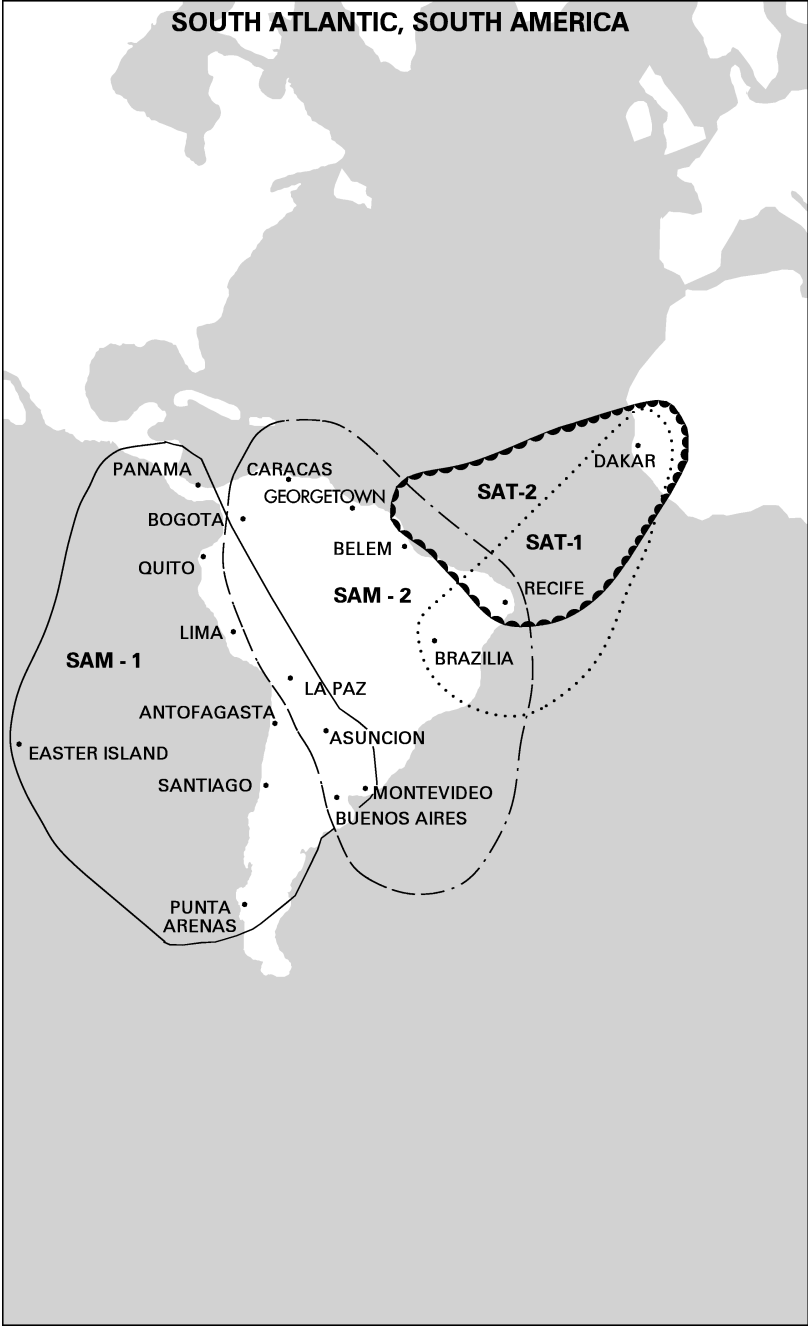
GEORGETOWN -
6730.5 8855 10096

NEW YORK (130.7)
SATCOM VOICE 436623①
3455 5520 6586 8846 11330
17907

PIARCO -
5526 6577 8825 8855 8918
10096 11387 13297

①631-244-2492.

B-52 NATL/INTL FLIGHT DATA/PROCEDURES



NATL/INTL FLIGHT DATA/PROCEDURES B-53

SOUTH ATLANTIC, SOUTH AMERICA

SOUTH ATLANTIC (SAT 1,2)

BRASILIA

3452 8861 13357

CANARIES -

2854⑤ 3452⑤ 5565 6535 8861
11291 13315④ 17955④

CAYENNE

3023 5440 5526 5540 8825
11291 13297

DAKAR (127.3)

3452① 5565② 6535 6673 8861
11291 13315③ 13357③ 17955③

RECIFE

3452 5565 8861 13357 17955

SAL -

2854 5565 6535 8861 11291
13357 17955

①2000-0600Z. ②2100-0800Z. ③0600-2000Z.

④SR-SS. ⑤SS-SR.

WESTERN SOUTH AMERICA (SAM-1)

ANTOFAGASTA (127.3)

4669 5604 6649 10024

ASUNCION (126.9)

6649 10024 11397

CORDOBA (126.5) (125.1)

2944 6649 10024

EZEIZA (124.1) (124.5) (125.6)

2944 6649 10024 11360 17907

LA PAZ

4669 6649 10024

LIMA (126.9)

6649 10024

MENDOZA (122.1) (126.9)

2944 6649 10024

MONTEVIDEO (126.7)

6649 10024

PANAMA (126.9)

2944 6649

PASCUA/EASTER ISLAND①② - all freq (127.3)

4669 5643 6649 8667 10024
13300 13261

①O/R. ②SR-SS.

PUERTO MONTT (126.9)

4669 5454 6649 10024

PUNTA ARENAS (126.9)

4669 6649 10024

RESISTENCIA (126.9)

2944 6649 10024

SALTA (126.9)

2944 6649 10024

SANTA CRUZ

2944 4669 6649 10024 11360

SANTIAGO (127.3)

4669 5583 6649 10024 13300

EASTERN SOUTH AMERICA (SAM-2)

ASUNCION (126.9)

5526 8855 10096

BELEM

3479 5526 8855 10096

BOGOTA (126.9)

3488① 5556② 6649 8855 8918
10024 10096

①2300-1100Z. ②1100-2300Z.

BRASILIA

5526 8855 10096

CAYENNE

3023 5440 5526 5540 8825
11291 13297

CARACAS/MAIQUETIA (130.6)

5526 8855 10096

CURITIBA -

3479 5526 8855 10096

EZEIZA (124.1) (124.5) (125.6)

3479 5526 8855 10096 17907

GEORGETOWN

6730.5 8855 10096

GUAYAQUIL① (121.5) (126.9)

4669 5595 6535 6649 10024
11360

①SR-SS.

LA PAZ

5526 8855 10096

B-54 NATL/INTL FLIGHT DATA/PROCEDURES

LETICIA (127.5)
3488 5526 6553 8855 8894
10096

1000-0300Z, extn O/R.

LIMA (126.9)
6649 10024

MANAUS
3479 5526 8855 10096

MONTEVIDEO (126.7)
3479 5526 8855 10096 17907

PANAMA (126.9)
2944 6649

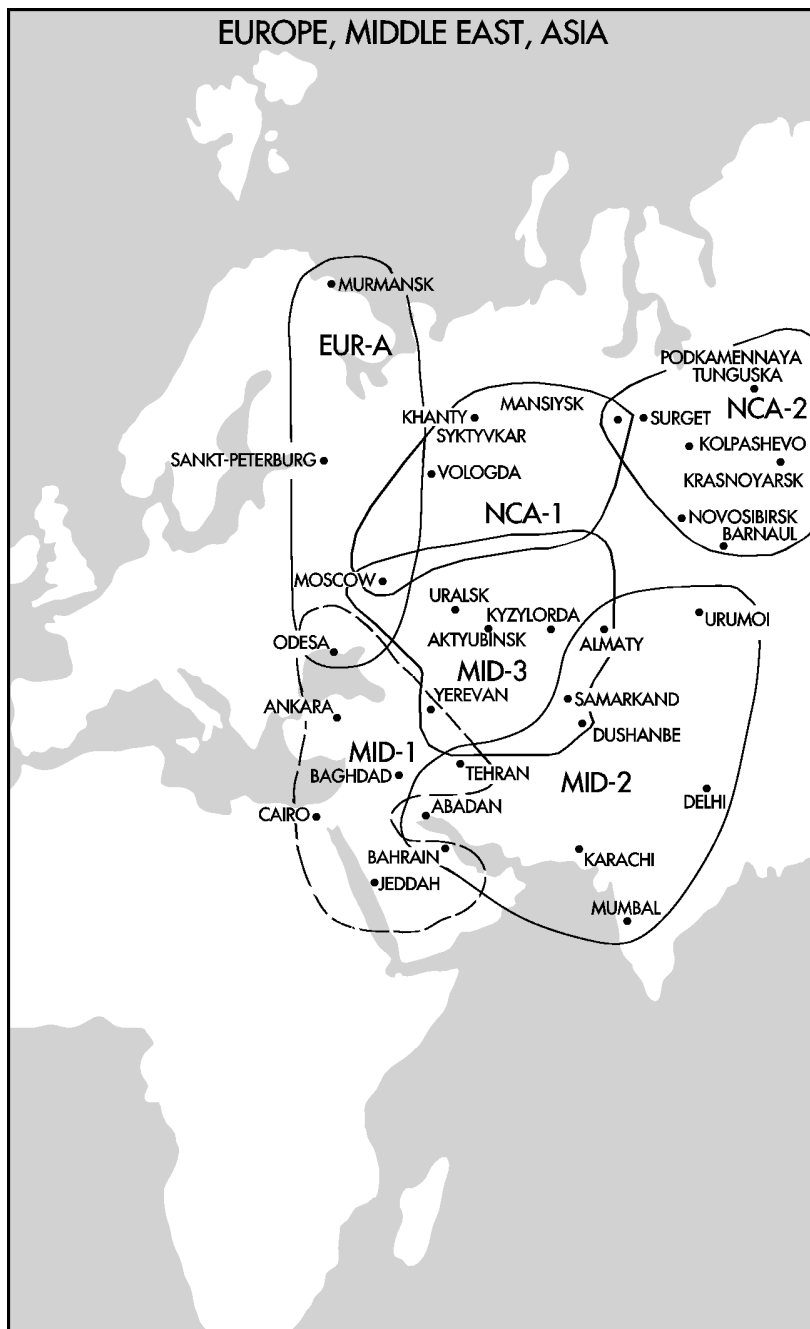
PIARCO (124.2)
2887 2910 5526 6577 8825
8855 8918 10096 11387 13297

PORTO VELHO
3479 5526 8855 10096

RECIFE
8855 10096

SANTA CRUZ
3479 5526 8855 10096 13297

EUROPE, MIDDLE EAST, ASIA



B-56 NATL/INTL FLIGHT DATA/PROCEDURES

EUROPE, MIDDLE EAST, ASIA

EUROPE (EUR-A)					(MID-2)				
BEIRUT -					BAHRAIN (126.7)				
2910	4689	8875			2992	5658	5667	8918	13288
MALTA (128.7)					13312				
5661	10084				MUMBAI (126.9)				
MOSCOW -					3467	5658	8879	10018	13288
11390					DELHI (127.1)				
MURMANSK -					2872	3467	5580	5601	5658
4672	9024				8906	8948	10018	13288	
SANKT - PETERBURG -					KABUL (120.9)				
4672	9024				3467	5658	10018	13288	
TUNIS -					KATHMANDU (126.5) (124.7)				
3411	4689	5519	8826		2923	6607			
MIDDLE EAST (MID-1)					KARACHI (125.4) (126.5) (128.3)				
ADEN (124.5)					3467	5658	10018		
5100					KUWAIT				
AMMAN (128.5)					5658	10018	13288		
2992	5667	8918	13312		LAHORE (119.1) (125.6) (127.5)				
BAGHDAD					3467	5658	10018		
2992	5667	8918			MUSCAT (123.95 124.55)				
BAHRAIN (126.7)					5658①	10018①			
2992	5658	5667	8918	13288	NAGPUR (123.9)				
13312					2872	5601	6583	8861	8948
BEIRUT					TEHRAN (133.4)				
3404	5603	8847	13336		5856	5667	6925	8091	8918
DAMASCUS					10018	13288	13312		
2992①	5667	8918	13312②		URUMQI (119.3)				
JEDDAH -					3467	5658	10018		
5667	8918				VARNASI (119.0)				
KUWAIT					2872	5580	8948		
2992	5667	8918	13312		①HO				
RIYAN					(MID-3)				
7595	8918				ALMATY				
SANAA					3467	4669	4728	8951	10018
13288					AKTYUBINSK				
TEHRAN (133.4)					3440	4669	4728	5586	8951
5856	5667	6925	8091	8918	DUSHANBE				
10018	13288	13312			3476	4095	5658	8145	9955
① SS-SR					10018				
					KYZYLORDA				
					4669	8951			

NATL/INTL FLIGHT DATA/PROCEDURES B-57

MOSCOW

11390

SAMARKAND

3467 5658 10018

TASHKENT

3467 4669 4728 5658 8951
10018

URALSK

3440 4669 4712 5586 8951

YEREVAN

2926 4712 5487 8918 11333

NORTH CENTRAL ASIA (NCA-1)

KHANTY MANSIYSK (134.6 135.6)

MOSCOW

11390

SYKTYVKAR

3422 4712 5596

VOLOGDA

4672

(NCA-2)

BARNAUL

3046 6704

KHANTY MANSIYSK (134.6 135.6)

KIRENSK

3046 3425 4728 6704

KOLPASHEVO

4712

KRASNOYARSK

3046 6704

NOVOSIBIRSK

4712

PODKAMENNAYA TUNGUSKA (133.2)

SURGUT (129.3 132.2 133.3)

YENISEYSK

3046 6704

B-58 NATL/INTL FLIGHT DATA/PROCEDURES



NATL/INTL FLIGHT DATA/PROCEDURES B-59

AFRICA

AFRICA (AFI-1)

ABIDJAN (121.1)

6535 6673 8861 13294

BAMAKO -

6673 8861

BOUAKE -

6673

CASABLANCA -

3452① 5554 6535 8861 13357②

DAKAR (127.3)

3452③ 5565④ 6535 6673 8861

11291 13315⑤ 13357⑤ 17955⑤

MONROVIA -

3452 6638 6673 8861 8882

NOUADHIBOU -

6673 8861

NOUAKCHOTT -

6673 8861

SAL -

3452

①SS+30 to SR-30. ②O/R. ③2000-0600Z.

④2100-0800Z. ⑤0600-2000Z.

(AFI-2)

ALGIERS -

5652① 8894 13273①

GAO 8894②

KANO (118.5)

3411 5519 8826 13304

NIAMEY (126.1)

3419③ 5652③ 8894③ 13294③

TRIPOLI -

3419 5652 8894 13273

TUNIS 3411 5519 8826

①No SSB ②0600-1800Z. ③SELCAL

(AFI-3)

ADDIS ABABA (125.1 129.5)

3467 5658 6574 8870 11300

13288 17961

ADEN

5658 11300

BENGHAZI -

3467 5658 11300 13336

BUJUM BURA -

8879 8903 8913 11300 13294

CAIRO (130.9)

3467① 5658 6574 11300 13288②

DAR ES SALAAM (119.3 123.3)

5517 8870 8879 11300

DJIBOUTI (128.9)

5658 11300

HARGEISA (126.1)②

5658② 11300②

JEDDAH -

5658 11300

KHARTOUM (124.7)

3467 5517 11300 13288

MOGADISHU (120.9)

5658 11300

MUMBAI (126.9)

2872 3467 5601 5634 5658

6655 8879 8909 8948 10018

11300 13288

NAIROBI (118.5 120.5)

3467 5517 5634 6559 8879

8888 11300 13306

RIYAN -

5658 11300 13288

SANAA -

11300

SEYCHELLES (120.2 118.3)

3467 5517 5658 11300 13288

17961

TRIPOLI -

5517 11300

①SS-SR. ②SR-SS.

(AFI-4)

ACCRA -

5493 6586 8903 13294

BRAZZAVILLE (121.1)

2878 5493④ 6559 8873 8903⑤

13294②

B-60 NATL/INTL FLIGHT DATA/PROCEDURES

JOHANNESBURG (126.7)
5565 6559 8861 13315 17955
21926

KANO (118.5) (124.1)
3411 5519 8826 13304

KINSHASA (123.7) (126.1) (128.1)
2851 2878 5493④ 6559⑤ 8888
8903⑤ 13294② 13304

LAGOS -
8826 5519

LUANDA (118.1) (119.1) (121.9)
2878 5493 8903 13294

LUSAKA (120.5) (120.9) (128.9)
2878 5493④ 8873 8879⑤

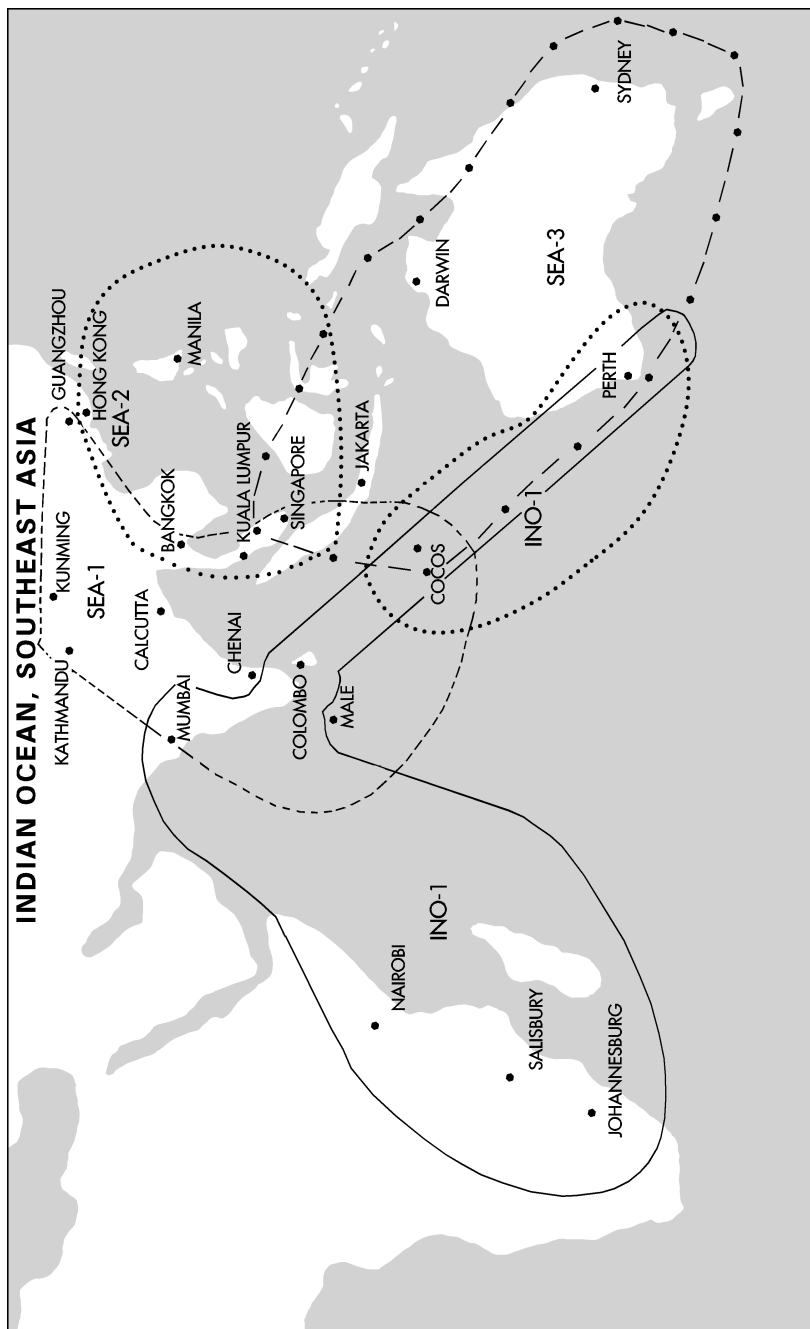
NIAMEY (126.1)
2878① 5493⑤ 6586⑤ 8903⑤ 13273⑤

SAO TOME/SALAZAR-
5493④ 8903④ 13294②

SEYCHELLES (120.2 121.5)
10018

WINDHOEK ③ (124.7)
8861

①O/R. ②0700-1800Z. ③HS. ④SS-SR.
⑤SELCAL



B-62 NATL/INTL FLIGHT DATA/PROCEDURES

INDIAN OCEAN, SOUTHEAST ASIA

INDIAN OCEAN (INO-1)

ANTANANARIVO (128.9) (125.1)

5634① 8879 13306②

BEIRA (126.5 130.9)

2878 3476 5493 6586 8879

COCOS (118.1)

3476 5634 8879 13306 17961

COLOMBO -

8879 13306

DAR ES SALAAM (119.3 123.3)

5517 8870 8879 11300

JOHANNESBURG (126.7)

5634 8879

LUSAKA (120.5 128.9)

5634 8873 8879 13306

MAHAJANGA -

8879

MAURITIUS -

3476 5634 8879 13306③

MUMBAI (126.9)

2872 3467 5601 5634 5658
6655 8879 8909 8948 10018
11300 13288

NAIROBI (118.5)

6559 13306

PERTH (123.9) (122.4)

3476 5634 8879 13306 17961

ST. DENIS/GILLOT -

3476 5634 8879

SEYCHELLES (120.2 119.7)

3476 5634 8879 13306 17961

TOAMASINA -

8879

①1500-0400Z. ②0300-1500Z. ③For
operational requirements, OT O/R.

SOUTHEAST ASIA (SEA-1)

CALCUTTA (127.3)

2872 2923 2947 3470 3491
5484 5580 6556 6583 8861
8906 8948 10066 13318

CHENNAI (124.1)

2872 3470 5670 6583 6655
8861 8909 10066 13318

COCOS (118.1)

11285

COLOMBO -

3470 5670 11285 13318 17907

DHAKA (121.3)

2947 3491 6556 10066

KARACHI (125.4) (126.5) (128.3)

3467 5658 10018

KATHMANDU (126.5)(124.7)

2923 6607

KUALA LUMPUR -

3470 6556 10066 13318

MALE INTL. -

3470 5670 11285 13318 17907

MEDAN -

3470 5670 11285 11396 13318
17907

NAGPUR (123.9)

2872 5601 6583 8861 8948

SINGAPORE -

6556 10066 13318

TRIVANDRUM (120.6)

3470 5670 11285

VARNASI (119.0)

2872 5580 8948

SOUTHEAST ASIA (SEA-2)

HOCHIMINH (123.3)

11297 11396 13309 5655 8942

HONG KONG (127.1)

3485 5655 8942 11396 13309

KINABALU -

6589① 11396

KUALA LUMPUR -

5655 8942 11396

MANILA (124.9)

3485 5655 8942 11396 13309

PHNOM PENH (127.5)

8942

SINGAPORE -

5655 8942 11396

①For operational requirements. OT O/R.

NATL/INTL FLIGHT DATA/PROCEDURES B-63

SOUTHEAST ASIA (SEA-3)

BALI -

3470 6556 11396

COCOS (118.1)

6556 13318

JAKARTA -

3470 6556 10066 11396 13318
17907

PERTH (123.9) (122.4)

3470 6556 11396 13318 17907

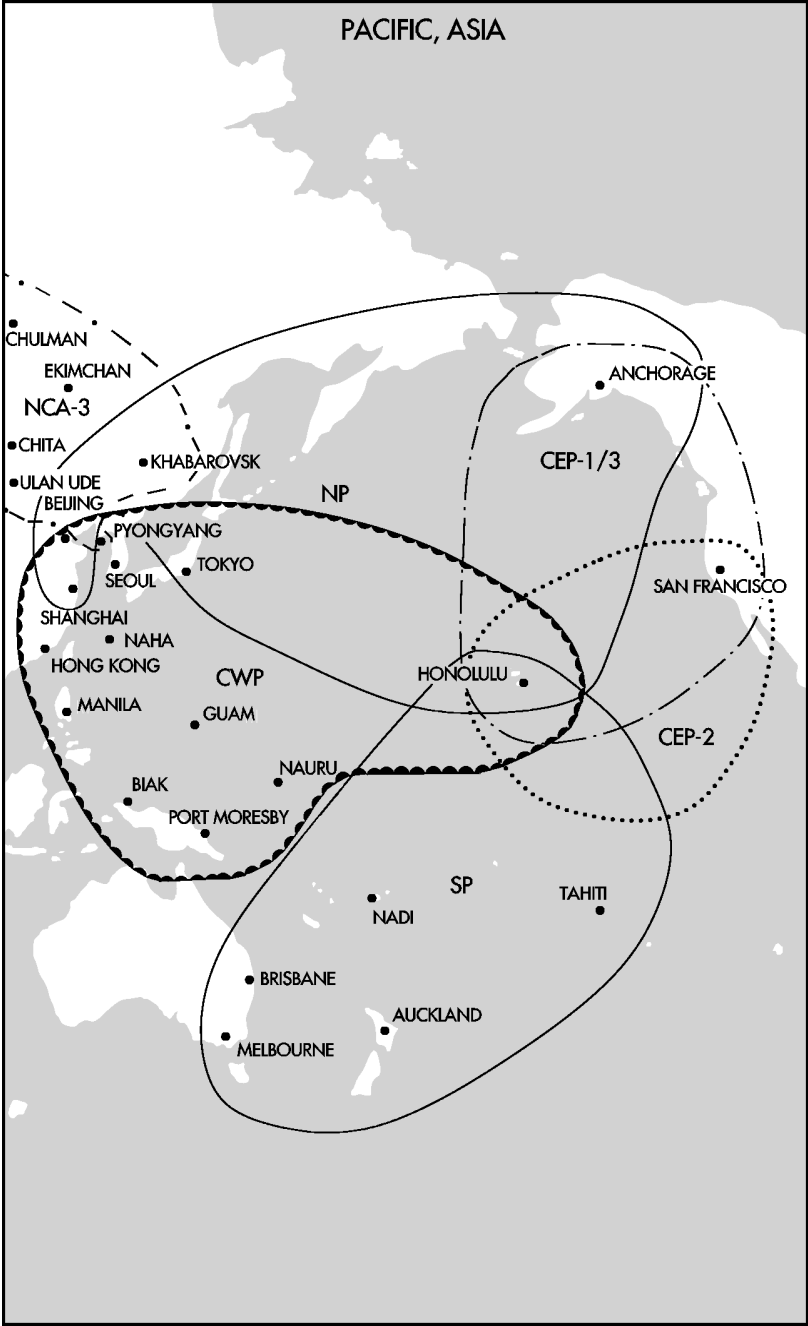
SINGAPORE -

6556 13318

UJUNG PANDANG -

3470 6556 11396

B-64 NATL/INTL FLIGHT DATA/PROCEDURES



NATL/INTL FLIGHT DATA/PROCEDURES B-65

PACIFIC, ASIA

CENTRAL WEST PACIFIC (CWP)

BEIJING -

3016 6571 8897

DAEGU (125.7)

6425 6665 6675

HONG KONG (127.1)

6532 8903 13300

MANILA (124.9)

2998 6532 6562 8903 13300
17904

NAHA (126.9)

2998 3455 4666 6532 8903
11384 13300 17904

PORT MORESBY (120.9)

3419 3425 5565 6622 8837
8861 11393

SAN FRANCISCO (ARINC) (131.95)

SATCOM VOICE 436625^①
2998 4666 6532 8903 11384
13300 17904 21985

SEOUL (127.1)

3004 6532 8903 10081 13300
13303 17904

SHANGHAI -

3016 6571 8897

TAIPEI (127.3)

6532 8903 13300

TOKYO (127.3) (127.4)

2998 3455 4666 6532 8903
11384 13300 17904

①925-371-3920

NORTH PACIFIC (NP)

BEIJING -

3016 6571 8897

SAN FRANCISCO (ARINC) (131.95)

SATCOM VOICE 436625^①
2932 5628 5667 6655 8915
8951 10048 11330 13273 13339
17946 21925

SHANGHAI -

3016 6571 8897

TOKYO (126.7)

2932 5628 6655 8951 10048
11330 13273 17904

①925-371-3920

CENTRAL EAST PACIFIC (CEP-1.3)

SAN FRANCISCO (ARINC) (129.4^①) (131.95)

SATCOM VOICE 436625^②
3413 3452 5574 6673 8843
10057 13354

①Available to call San Francisco between
Seattle and Anchorage.

②925-371-3920

(CEP-2)

SAN FRANCISCO (ARINC) (129.4^①) (131.95)

SATCOM 436625^①
2869 5547 11282 13288

①925-371-3920

SOUTH PACIFIC (SP)

AUCKLAND -

3467 5643 8867 13261 17904

BRISBANE -

3467 5643 8867 13261 17904

MELBOURNE -

3461 4693 6580 8858

NADI (126.7)

3425 3467 5643 6553 8846
8867 11339 13261 17904

PASCUA/EASTER ISLAND (126.9)^①

4669^① 5643 6649 8667 13300

RAROTONGA (118.1)

3425 6553 8846 11339 13354

SAN FRANCISCO (ARINC) (131.95)

SATCOM VOICE 436625^②
3467 5643 8867 13261 17904

TAHITI (126.7)

3467 5643 8867 13261 17904

①O/R.

②925-371-3920

NORTH CENTRAL ASIA (NCA-3)

CHITA -

3425 6670

CHULMAN -

2986 3461 4465 4728 5568
6589

B-66 NATL/INTL FLIGHT DATA/PROCEDURES

EKIMCHAN -					KIRENSK -			
3461	6589				3046	3425	4728	6704
KHABAROVSK -					ULAANBAATAR -			
2868	3102	3461	4465	5557	5505	5715		
6589	6692	7870						
					ULAN UDE -			
					3425	6670		

NATL/INTL FLIGHT DATA/PROCEDURES B-67

13. RVSM Basic Concept for Contingencies

a. The in flight contingency procedures for the North Atlantic Track Minimum Navigation Performance (NAT MNPS), published in Doc 7030, were revised to provide for Reduced Vertical Separation Minimum (RVSM) implementation in NAT MNPS airspace.

b. The basic concepts for contingencies are:

(1) Guidance for contingency procedures should not be interpreted in any way which prejudices the final authority and responsibility of the pilot in command for the safe operation of the aircraft.

(2) If the pilot is unsure of the vertical or lateral position of the aircraft or the aircraft deviates from its assigned altitude or track for cause without prior ATC clearance, then the pilot must take action to mitigate the potential for collision with aircraft on adjacent routes or flight levels. In this situation, the pilot should alert adjacent aircraft by making maximum use of aircraft lighting and broadcasting position, flight level, and intentions on 121.5 MHz.

(3) Unless the nature of the contingency dictates otherwise, the pilot should advise ATC as soon as possible of a contingency situation and if possible, request an ATC clearance before deviating from the assigned route or flight level.

(4) If a revised ATC clearance cannot be obtained in a timely manner and action is required to avoid potential conflict with other aircraft, then the aircraft should be flown at an altitude and/or on a track where other aircraft are least likely to be encountered:

(a) The pilot may offset half the lateral distance between routes or tracks.

(b) The pilot may offset half the vertical distance between altitudes normally flown.

(c) The pilot may also consider descending below FL 285 or climbing above FL 410. (Flight above FL 410 or below FL 285 may limit exposure to conflict with other aircraft).

(5) When executing a contingency maneuver the pilot should:

(a) Watch for conflicting traffic both visually and by reference to TCAS/ACAS, if equipped.

(b) Continue to alert other aircraft broadcasting on 121.5 MHz and using aircraft lights.

(c) Continue to fly offset tracks or altitudes until an ATC clearance is obtained.

(d) Obtain an ATC clearance as soon as possible.

c. Wake Turbulence Procedures. These procedures provide for the contingency use of a 2 NM lateral offset to avoid exposure to wake turbulence. The procedures have been published in State NOTAMS and AIPs and are planned for publication in Regional Supplementary Procedures. (AFFSA-XOP FIL-02-21/FAA-91-RVSM NAT MNPSA Ops Manual)

B-68 NATL/INTL FLIGHT DATA/PROCEDURES

Register of National Clearances and Operational Restrictions On the Use of IFF Mark XII MODE 4

1. The policy and procedures adopted by NATO for the management of IFF/SIF are contained in ACP 160 NATO Supplement 1(E), para. 210 on IFF interference states:

"Within their AOR'S, some nations restrict their operations of IFF/SIF interrogators/transponders; therefore, approval for their use shall be sought from national authorities. (Mode 4 is not approved for general use by most European nations.)"

2. NATO promulgates national restrictions for use of Mode 4 through a working paper, AC/92 (CNS) WP (2001) 1 dated 25 SEP 01. The following table is an extract of this working paper and is intended to provide aircrews with the basic national information for Mode 4 operations and the national POC's for obtaining permission to operate IFF/SIF Mode 4 within a respective country.

NATL/INTL FLIGHT DATA/PROCEDURES B-69

Country	Airbourne Mode 4 Authorization	Airborne IFF Mode 4 Interrogations	National Clearance POCs	National publication of information
Belgium	None	Not allowed	BE Air Staff, VS3_Sector Opns, Quarter Reine Elizabeth 1 rue d'Evere, B-1140 Brussels FAX +32- 2701-3032	BE MIL AIP BELGIUM
Canada	Yes, but only at specified locations and geographical areas	Yes, areas of opn are Canadian western, eastern & Arctic coastal/off shore regions only, on non-interference, no protection basis	Direction Electronics Communications and Spectrum Services 5, National Defense HQ, Ottawa, Canada	Not provided
Czech Republic	None	Not allowed	J6/GS Czech Army, PO BOX 69, 16001 Prague 6 FAX+42023119330	Not provided
Denmark	May be granted on special occations	Not allowed	NARFA, Denmark	Not provided
France	Yes	Permitted in accordance with ACP 160 procedures	CDAOA/CIS Office - Attn: LTC STOESSLE/BA 921/ 95155- TAVERNY CEDEX	Not provided
Germany	In accordance with Ref 1, limited in space and time. Annex 2 of this doc is "Regulation for a Mode 4 use limited in time and space over the territory of the Fed. Rep. Germany in Peace" and is to be observed. In addition, the approbate requirements within ICAO Annex 10 and STANAG 4193 are to be met.	No airborne IFF Mode 4 interrogations are allowed because no frequency application has yet been filed for thispurpose.	See paragraphs 2.7 and 4 of Annex 2 to Reference 1.	Not provided

B-70 NATL/INTL FLIGHT DATA/PROCEDURES

Country	Airbourne Mode 4 Authorization	Airborne IFF Mode 4 Interrogations	National Clearance POCs	National publication of information
Greece	Not provided	Not provided	Not provided	Not provided
Hungary	Not provided	Not provided	Not provided	Not provided
Italy	Not provided	Not provided	Not provided	Not provided
The Netherlands	Only land-based and shipborne use of Mode 4 is allowed, with a max. of seven interrogators operating in a specific time period.	Not allowed at present	Air Traffic Control Technical Affairs/Navigation Attn: Mr. H.L. van Noort or Mr. F.A. Frowijn POB 75200 1117 ZT SCHIPHOL-O The Netherlands	Not provided
Norway	Yes	Are allowed, subject to special procedures.	A frequency supportability request is required at least 30 days prior to operation of Mode 4 over Norwegian territory. Using the Frequency Management Sub-Committee (FMSC) 14 point message format, message should be forwarded to CHOD Norway CIS Staff using SIC: SPA	Not provided
Poland	No authorization	Not allowed	Not applicable	Not provided
Portugal	In principle, yes	Not applicable	Clearance requests should be submitted to CHOD PO via Frequency Management Sub-Committee (FMSC) Representative	Not provided
Spain	To be advised	To be advised	To be advised	To be published in national Aeronautical Information Publication

NATL/INTL FLIGHT DATA/PROCEDURES B-71

Country	Airbourne Mode 4 Authorization	Airborne IFF Mode 4 Interrogations	National Clearance POCs	National publication of information
Turkey	By airborne or surface platforms within Turkish airspace is not allowed	Not allowed	Clearance request should be submitted to TGS	Not provided
United Kingdom	Limited use approved only on case-by-case basis at present	Currently allowed only by Royal Navy Sea King AEW for test and development purposes. Caveats are set in parallel with the equipment.	Secretariat National IFF/SSR Committee Surveillance and Spectrum Management K6 Gate 6 CAA House 45-49 Kingsway London WC2B 6TE Tel:+442074536534 FAX +442074536565	Information on clearances is distributed to individual applicants.

(TFMWGE/USA 03-0284)

**INTENTIONALLY
LEFT
BLANK**

SECTION C

METEOROLOGICAL INFORMATION

TABLE OF CONTENTS

	<u>PAGE NO.</u>
Automated Surface Observation System (ASOS)	C-52
Automated Weather Observing System (AWOS)	C-51
Automatic Terminal Information Service (ATIS)	C-59
FAA Enroute Flight Advisory Service (EFAS)	C-48
FAA Pilot-to-Weather Briefer Service	C-47
FAA Weather Broadcasts	C-47
Military Weather/NOTAM Briefing Facilities	C-3
National Weather Service - FAA Weather Information Service	C-46
Pilot-to-Metro (PMSV) and Weather Radar Services -	
Pilot-to-Metro Service and Weather Radar Facilities	
(DoD CONUS Stations)	C-19
Pilot-to-Metro Service and Weather Radar Facilities	
(DoD Non-CONUS Stations)	C-23
Pilot-to-Metro Service, USAF	C-13
Pilot-to-Metro Service, USN and USMC	C-16
Pilot Weather Reports (PIREPs) Format	C-60
SIGMETs and AIRMETS	C-48
Telephone Weather/NOTAM Briefings	C-2
NATO Color Coded Weather Conditions	C-63
VOLMET - Voice Weather Broadcasts	C-26
World Meteorological Organization Ground/Air Code	C-62

C-2 METEOROLOGICAL INFORMATION

1. TELEPHONE WEATHER/NOTAM BRIEFINGS

a. Military pilots departing a location where military weather and NOTAM services are not available will obtain required information as follows:

(1) Contact the Operational Weather Squadron (OWS) responsible for your area. OWSs are located worldwide to be the primary 24-hour weather-briefing source. Local base/post weather flights may assist transient aircrews if and when higher priority taskings and local mission support allow. Contact information is listed on the following pages; or

(2) Obtain information from accredited local agencies.

(3) Real time NOTAM updates are available at <https://notams.jcs.mil>.

b. When talking to a military forecaster, please provide the following information at least 2 hours prior to desired brief time:

(1) Name of person calling.

(2) Aircraft type and call sign.

(3) VFR or IFR and proposed altitude.

(4) ETD for departure point and ETA for destination and alternates.

(5) Route.

(6) Enroute stops, if applicable (in order, with ETAs).

METEOROLOGICAL INFORMATION C-3

2. MILITARY WEATHER/NOTAM BRIEFING FACILITIES

(AFFSA/XOIA Ltr dtd 24 Dec 03)

a. CONUS, EAST and CENTRAL CANADA, NORTH ATLANTIC, GREENLAND, ICELAND

AIR FORCE

15 OWS at Scott AFB, Under Command and Control of AMC TACC

Area of Responsibility: ND, SD, NE, MN, IA, WI, IL, IN, OH, WV, NY, PA, MD, DE, NJ, CT, RI, MA, NH, VT, ME, and DC.

Contact Information:

Voice: DSN 312-576-9697, Comm 618-256-9697

Fax: DSN 312-576-4855, Comm 618-256-4855

STU-III: DSN 312-576-9699

Airborne Contact via Phone Patch: DSN 312-576-9697

NIPRNET Homepage: <https://ows.scott.af.mil>

Global Mobility Missions:

Voice: DSN 312-779-4795, Comm 618-229-4795

Fax: DSN 312-779-2635, Comm 618-256-2635

STU-III: DSN 312-229-3342

Airborne Contact via Phone Patch: DSN 312-229-4795

NIPRNET Homepage: <https://ows.scott.af.mil>

15 OWS Area of Responsibility

Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings DSN Commercial	
Andrews AFB	858-2840/5826	858-2840/5826	301-981-2840/5826
Dover AFB	445-4175	445-4175	302-677-4175
Ellsworth AFB	675-1042	675-1042	605-385-1042
Ft Belvoir	656-7117/7106	656-7117/7106	703-806-7117/7106
Ft Drum	772-6065	772-6065	315-772-6065
Grand Forks AFB	362-4396	576-9755	618-256-9755
Grissom ARB	928-2203	928-2203	765-688-2203
McGuire AFB	650-3992/3568	650-3992-3568	609-754-3992/3568
Minot AFB	453-6385	576-9755	618-256-9755
Offutt AFB	271-3459	271-3459	402-294-3459
Scott AFB	576-5906/3363	576-5905/3363	618-256-5905/3363
Selfridge ANGB	273-5901	576-9755	618-256-9755
Thule AS	268-3840 ext 2201	268-3840 ext 2201	-
Westover ARB	589-3100	589-3100	413-557-3100
Wright Patterson AFB	787-7779	787-7779	937-257-7779

C-4 METEOROLOGICAL INFORMATION

25 OWS at Davis Monthan AFB, Under Command and Control of 12 AF.

Area of Responsibility: WA, OR, CA, ID, MT, WY, CO, UT, NV, AZ, NM, and western panhandle of TX (west of 100° W).

*Exceptions:

- 1) 25 OWS provides support to 90th Space Wing (F.E. Warren AFB) assets within the 15 OWS AOR.
- 2) 25 OWS AOR extends out to the US Air Defense Identification Zone (ADIZ), approximately 200 miles off the U.S. West coasts.
- 3) 30 WS provides supports to Vandenburg AFB

Contact Information:

Voice: DSN 312-228-6598/6599, Comm 520-228-6598/6599

Toll Free: 1-877-451-8367

Fax: DSN 312-228-7361, Comm 520-228-7361

STU-III: DSN 312-228-6589

Airborne Contact via Phone Patch: DSN 312-228-6598/6599

NIPRNET Homepage: <https://25ows.dm.af.mil>

SIPRNET Homepage: <http://25ows.davismonthan.af.smil.mil>

METEOROLOGICAL INFORMATION C-5

25 OWS Area of Responsibility			
Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Beale AFB	368-9134	228-6598/6599	520-228-6598/6599
Buckley AFB	877-9785	228-6598/6599	520-228-6598/6599
Cannon AFB	681-2748/2749	228-6598/6599	520-228-6598/6599
Davis Monthan AFB	228-6014	228-6598/6599	520-228-6598/6599
Edwards AFB	527-4472	228-6598/6599	520-228-6598/6599
F.E. Warren AFB	481-3431/2488	228-6598/6599	520-228-6598/6599
Fairchild AFB	657-5514	228-6598/6599	520-228-6598/6599
Ft Bliss	N/A	228-6598/6599	520-228-6598/6599
Ft Carson	691-3620	228-6598/6599	520-228-6598/6599
Ft Huachuca	879-2865/2859	228-6598/6599	520-538-2865/2859
Ft Irwin	470-4328	228-6598/6599	520-228-6598/6599
Ft Lewis	357-7061	228-6598/6599	520-228-6598/6599
Hill AFB	777-2018	228-6598/6599	520-228-6598/6599
Holloman AFB	572-3924	228-6598/6599	520-228-6598/6599
Kirtland AFB	246-9707	228-6598/6599	520-228-6598/6599
Indian Springs	N/A	228-6598/6599	520-228-6598/6599
Luke AFB	896-6805	228-6598/6599	520-228-6598/6599
Malmstrom AFB	632-2710	228-6598/6599	520-228-6598/6599
March ARB	447-3602	228-6598/6599	520-228-6598/6599
McChord AFB	382-3434/5005	228-6598/6599	520-228-6598/6599
Mountain Home AFB	728-6303/6304	228-6598/6599	520-228-6598/6599
Nellis AFB	682-4744	228-6598/6599	520-228-6598/6599
Peterson AFB	834-4337	228-6598/6599	520-228-6598/6599
Schriever AFB	560-4106/3987	228-6598/6599	520-228-6598/6599
Travis AFB	837-5549	228-6598/6599	520-228-6598/6599
USAF Academy	333-2058/2059	228-6598/6599	520-228-6598/6599
Vandenberg AFB	276-8022	276-8022	805-606-8022

Transient Flight Weather Briefings at Toll Free 1-877-451-8367.

C-6 METEOROLOGICAL INFORMATION

26 OWS at Barksdale AFB, Under Command and Control of 8 AF

Area of Responsibility: KS, MO, OK, AR, TX (except western panhandle), LA, MS, a portion of USJFCOM AOR to include Bermuda.

*Exceptions:

1) 26 OWS AORs extends out to the US Air Defense Identification Zone (ADIZ), circa 200 miles off the U.S. TX, LA & MS coasts.

Contact Information:

Voice: DSN 312-781-4775, Comm 318-456-4775

Toll Free: 1-866-223-9328

Fax: DSN: 312-781-3493, Comm 318-456-3493

NIPRNET Homepage: <http://26ows.barksdale.af.mil>

SIPRNET Homepage: <http://ows.barksdale.af.smil.mil>

26 OWS Area of Responsibility

Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Altus AFB	866-7522	781-4775	318-456-4775
Barksdale AFB	781-3136-/3176	781-4775	318-456-4775
Columbus AFB	742-2970	781-4775	318-456-4775
Dyess AFB	461-2524	781-4775	318-456-4775
Ft Hood	738-9620/9400/9166	781-4775	318-456-4775
Ft Leavenworth	N/A	781-4775	318-456-4775
Ft Leonard Wood	581-0272	781-4775	318-456-4775
Ft Polk	863-4100/4021	781-4775	318-456-4775
Ft Riley	N/A	781-4475	318-456-4775
Ft Sill	639-4000/3200	781-4475	318-456-4775
Lackland AFB (Kelly Field Annex)	945-5709	781-4775	318-456-4775
Keesler AFB	597-3305	781-4775	318-456-4775
Laughlin AFB	732-5654	781-4775	318-456-4775
Little Rock AFB	731-6152	781-4775	318-456-4775
McConnell AFB	743-3707	781-4775	318-456-4775
Randolph AFB	487-3040	781-4775	318-456-4775
Sheppard AFB	736-4256	781-4775	318-456-4775
Tinker AFB	884-3493	781-4475	318-456-4775
Vance AFB	448-3061	781-4475	318-456-4775
Whiteman AFB	975-3061	781-4775	318-456-4775

Transient Flight Weather Briefings at Toll Free 1-866-223-9328.

METEOROLOGICAL INFORMATION C-7

NAVY

NAS Keflavik, Iceland

Navy Switchboard DSN is available for all overseas calls.

DSN

450-0111 x-7829/4302

28 OWS at Shaw AFB, Under Command and Control of 9 AF

Area of Responsibility: KY, TN, AL, VA*, NC, SC, GA, FL (including Florida Keys)

*Exceptions:

- 1) 15 OWS supports the Washington D.C. area.
- 2) 28 OWS AORs extends out to the US Air Defense Identification Zone (ADIZ), circa 200 miles off the U.S. VA, NC, FL, & AL coasts.
- 3) 45 WS provides support to Cape Canaveral AS and Patrick AFB
- 4) Contract personnel provide weather support at Dobbins ARB.

Contact Information:

Voice: DSN 965-0939/40/41/42, Comm 803-895-0939/40/41/42

Toll Free: 1-877-297-4129

Fax: DSN 312-965-0527, Comm 803-895-0527

STU-III: DSN 312-965-0565

Airborne Contact via Phone Patch: DSN 312-965-0588 ext 221

NIPRNET Homepage: <https://shaw28ows.af.mil>

SIPRNET Homepage: <http://shaw28ows.shaw.af.smil.mil>

28 OWS Area of Responsibility

Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Charleston AFB	673-3016	965-0588, ext 222-5	877-297-4129
Cape Canaveral AFS	467-8485/86	467-8485/86	321-853-8485/86
Dobbins ARB	625-5190	625-5290	770-919-5190
Eglin AFB	872-4800	965-0588, ext 222-5	877-297-4129
Ft Benning	835-5628/3824	965-0588, ext 222-5	877-297-4129
Ft Bragg	236-7100/7414	965-0588, ext 222-5	877-297-4129
Ft Campbell	635-5989/3421	965-0588, ext 222-5	877-297-4129
Ft Eustis	927-3196/5300/3343	965-0588, ext 222-5	877-297-4129
Homestead ARB	791-7511/7513	965-0588, ext 222-5	897-297-4129
Ft Knox	464-5653/5517	965-0588, ext 222-5	877-297-4129
Ft Rucker	558-8385/8397	965-0588, ext 222-5	877-297-4129
Ft Stewart	870-7823/4090	965-0588, ext 222-5	877-297-4129
Hunter AAF	971-5207/5467/5207	965-0588, ext 222-5	877-297-4129
Hurlburt Field	579-7423	965-0588, ext 222-5	877-297-4129
Langley AFB	574-5908	965-0588, ext 222-5	877-297-4129
MacDill AFB	968-4405/2854	965-0588, ext 222-5	877-297-4129
Maxwell AFB	493-2071	965-0588, ext 222-5	877-297-4129
Moody AFB	460-3457	965-0588, ext 222-5	877-297-4129

C-8 METEOROLOGICAL INFORMATION

28 OWS Area of Responsibility			
Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Patrick AFB	467-8485/86	965-0588, ext 222-5	877-297-4129
Pope AFB	424-6543	965-0588, ext 222-5	877-297-4129
Robbins AFB	468-5052	965-0588, ext 222-5	877-297-4129
Seymour Johnson AFB	722-4089	965-0588, ext 222-5	877-297-4129
Shaw AFB	965-2362/63/64	965-0588, ext 222-5	877-297-4129
Tyndall AFB	523-2609	965-0588, ext 222-5	877-297-4129

MARINE CORPS

Beaufort
Camp Pendleton
Cherry Point
Miramar
New River
Quantico
Twentynine Palms
Yuma

DSN

832-7868
365-3327
582-4442
577-4028/4029
484-6322/6968
278-2298
952-7809/7831
951-2265

COMMERCIAL

803-522-7868
760-725-3327
252-466-4442
619-537-4028/4029
910-451-6322/6968
703-640-2298
760-368-7809/7831
520-341-2265

NAVY

Brunswick
Cecil Field
Corpus Christi
El Centro
Fallon
Fort Worth
Jacksonville
Key West
Kingsville
Lakehurst
Lemoore
Mayport
Meridian
New Orleans
North Island
Norfolk (LP-1)
Oceana
Patuxent River
Pensacola
Point Mugu
Whidbey Island
Whiting Field N
Willow Grove

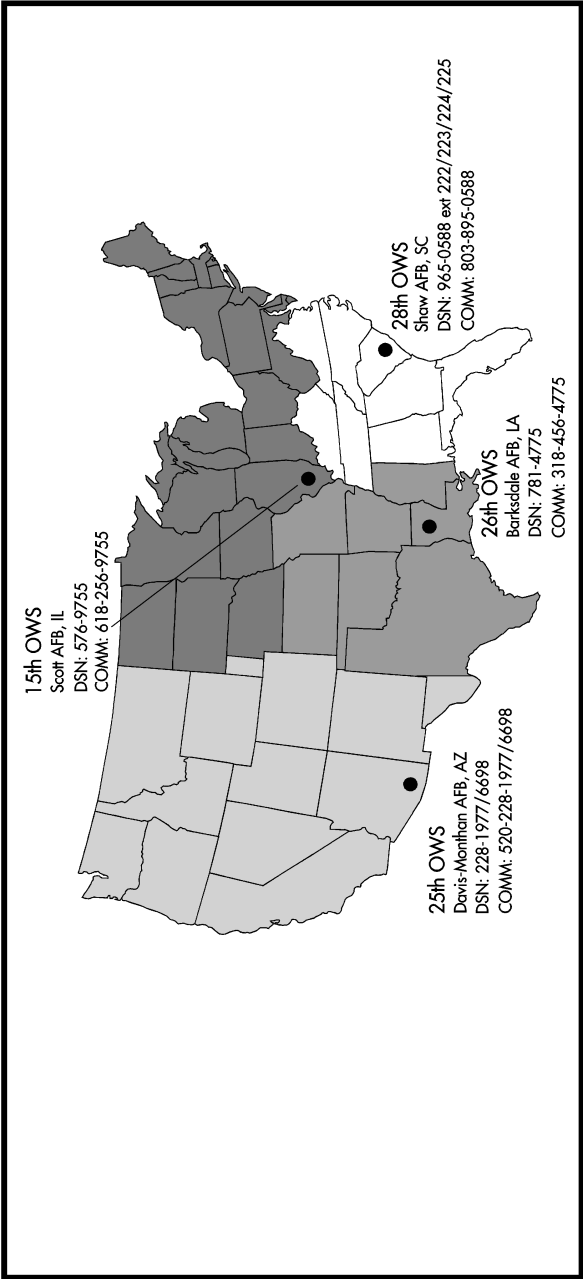
DSN

476-2356
860-5952/5862
861-2124/2125
958-8522
890-2816
739-7065
942-2541
483-2524
876-6350
624-2334
949-1020
960-6196/6197
446-2445
363-3207/3559
735-6033/9161
564-7797
433-2177
342-3174
922-2460/2386
351-8508
820-2677/2244
868-7119/7102
991-6578

COMMERCIAL

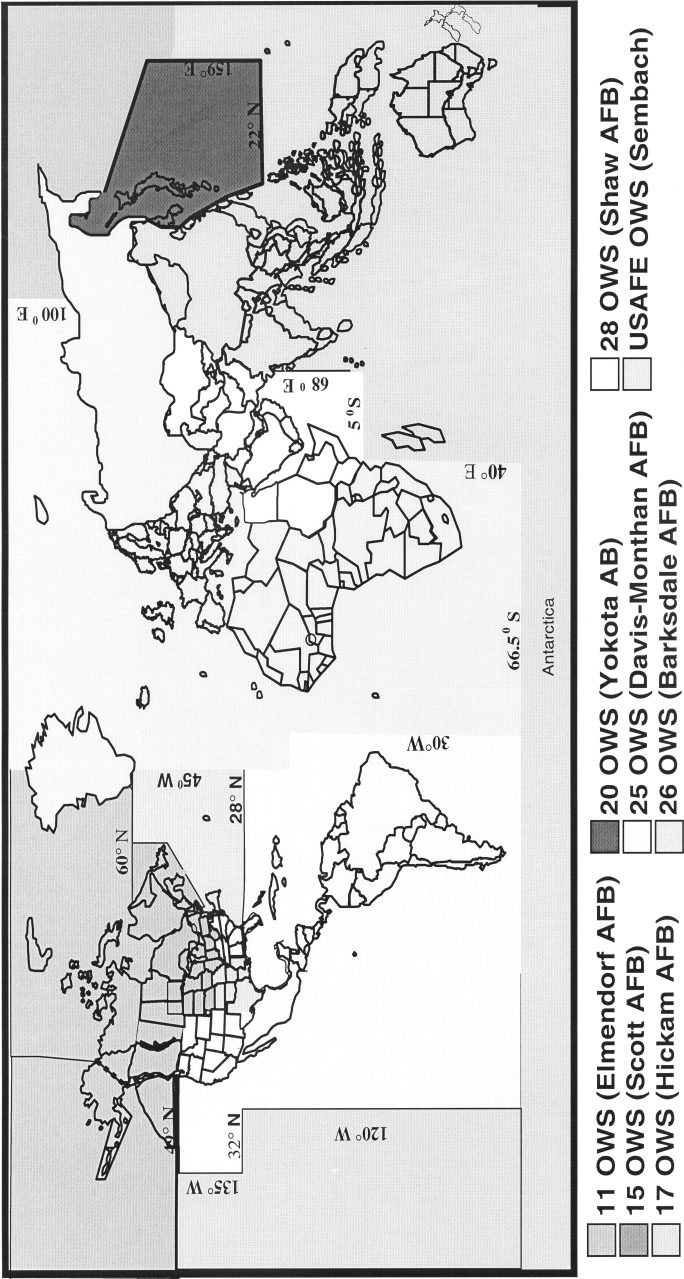
207-921-2357
904-778-5952/5862
512-939-2124
760-339-2522
775-426-2816/2425
817-782-7065
904-542-2541
305-292-2524
512-516-6350
201-323-2334
209-998-1020
904-270-6196/6197
601-679-2445
504-393-3207/3559
619-545-6033/9161
757-444-7797/1301
804-433-2177
301-342-3174
850-452-2460/2386
805-989-8508
360-257-2677/2244
850-623-7119/7102
215-443-6576

AF Weather OWS AORs - CONUS



- 15 OWS (Scott AFB)
- 25 OWS (Davis-Monthan AFB)
- 26 OWS (Barksdale AFB)
- 28 OWS (Shaw AFB)

AF Weather OWS AORs



METEOROLOGICAL INFORMATION C-11

b. EUROPE

AIR FORCE

USAFE OWS at Sembach AB, Under Command and Control of HQ USAFE/DO

Area of Responsibility: Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Italy, Kosovo, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russia (west of 60°E - Ural Mts), San Marino, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, Vatican City, Baltic Sea, Mediterranean Sea, Black Sea, Cyprus, Turkey, Syria, Lebanon, Israel. Africa: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central Africa Republic, Chad, Congo, Cote D'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Lesotho, Liberia, Libya, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

***Exceptions:**

1) 26 OWS has responsibility for operational-level weather support for Iceland, Azores, Bermuda, and portions of the North Atlantic. The 65 OSS/OSW is responsible for the terminal forecast for Lajes AB and provides flight weather briefings for transient aircrews.

Contact Information:

Voice: DSN 314-496-6145/6146, Comm 06302-67-6145

Fax: DSN 314-496-6184, Comm 06302-67-6184

STU III: DSN 314-496-6190

Airborne Contact via Phone Patch: DSN 314-496-6145

NIPRNET Homepage: <https://ows.sembach.af.mil>, <https://131.54.133.238/>

SIPRNET Homepage: <http://ows.usafe.af.smil.mil>

USAFE OWS Area of Responsibility

Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings DSN	
			Commercial
Aviano AB	632-7207/7628	496-6145/6146	06302-67-6145
Coleman	382-4555/5166	496-6145/6146	06302-67-6145
Giebelstadt	352-7241	496-6145/6146	06302-67-6145
Grafenwoehr	475-8349	496-6145/6146	06302-67-6145
Hanau	322-7416	496-6145/6146	06302-67-6145
Hohenfels	466-2891	496-6145/6146	06302-67-6145
Illesheim	467-4557	496-6145/6146	06302-67-6145
Incirlik AB	676-6880	496-6145/6146	06302-67-6145
Katterbach	467-2789	496-6145/6146	06302-67-6145
Lajes AB	CONUS 535-3657 Europe 245-3657	CONUS 535-3657 Europe 245-3657	001-351-95-540100- 23657
RAF Lakenheath	226-2168/4660	496-6145/6146	06302-67-6145
RAF Mildenhall	238-2050/2551	496-6145/6146	06302-67-6145
Ramstein AB	480-2185/2488	496-6145/6146	06302-67-6145
Sembach AB	-	496-6145/6146	06302-67-6145
Spangdahlem AB	452-6064/6749	496-6145/6146	06302-67-6145
Tuzla AB	768-2005	496-6145/6146	0632-67-6145
Wiesbaden	337-4124	496-6145/6146	06302-67-6145

C-12 METEOROLOGICAL INFORMATION

USAFE OWS Area of Responsibility			
Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings DSN Commercial	
Wurzburg	350-7518	496-6145/6146	06302-67-6145

ARMY

Heidelberg, Germany

DSN

373-6201

COMMERCIAL

49-6221-17-6201

NAVY*

Capodichino, Italy

Rota NS, Spain

Sigonella, Italy

Souda, Greece

DSN

314-626-5234

314-727-2404/2405

314-624-5285/5286

399-9489 x-274

*NAVY Switchboard DSN 225-9801 is available for all overseas calls.

Air Force Weather Agency (AFWA) at Offutt AFB, Strategic Weather Center

Area of Responsibility: Russia east of 60°E (Ural Mountains) - Siberia

Contact Information:

AFWA Operations Control Center

Voice: Primary--DSN 271-2586, Comm 402-294-2586

Secondary--DSN 271-6657, Comm 402-294-6657

Fax: DSN 271-5872, Comm 402-294-5872

STU-III: DSN 271-6558

Airborne Contact via Phone Patch: n/a

NIPRNET Homepage: <http://weather.afwa.af.mil>

SIPRNET Homepage: <http://weather.offutt.af.smil.mil>

METEOROLOGICAL INFORMATION C-13

c. PACIFIC

AIRFORCE

17 OWS at Hickam AFB, Under Command and Control of 502 AOG

Area of Responsibility: China, Taiwan, Mongolia, Thailand, Vietnam, Laos, Cambodia, Burma, Malaysia, Singapore, India, Nepal, Sri Lanka, Bangladesh, Diego Garcia, Madagascar, Australia, New Zealand, Indonesia, New Guinea, Hawaiian Islands, tropical and subtropical Pacific including WESTPAC, and most of the Indian Ocean

17 OWS Area of Responsibility

Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Anderson AFB	366-5230/1403	449-6262/7640	808-449-6262/7640
Bradshaw AAF	433-1810 ext 1464	-	-
Hickam AFB	449-6262/7640	449-6262/7640	808-449-6262/7640
Wheeler AFB	456-1017	449-6262/7640	808-449-6262/7640

20 OWS at Yokota AB, Under Command and Control of 605 AOG

Area of Responsibility: Japan, surrounding waters and part of the northern Pacific Ocean.

Contact Information:

Voice: DSN 315-225-9401 Comm 011-81-3117-55-9401

FAX: DSN 315-225-8744 Comm 011-81-3117-55-8744

STU Ill: DSN 315-225-6818

Airborne Contact via Phone Patch: DSN 315-225-9401

NIPRNET Homepage: <https://20ows.yokota.af.mil>

SIPRNET Homepage: N/A

20 OWS Area of Responsibility

Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Kadena AB	634-3140/4515/3163	225-9401	011-81-3117-55-9401
Misawa AB	226-3065	225-9401	-
Yokota AB	225-4549/9005/7213	225-9401	-
Cp Zama	263-5196	-	-

MARINE CORPS

Futenma, Okinawa
Iwakuni, Japan
Kaneohe Bay, Hawaii

DSN

636-3177
235-3005
457-2839

COMMERCIAL

808-257-2839

NAVY

Adak, Alaska
Atsugi, Japan
Diego Garcia, IO

DSN

317-892-4186/8069
315-264-3208
370-3670/3590

COMMERCIAL

907-592-4186/8069

C-14 METEOROLOGICAL INFORMATION

d. KOREA

AIR FORCE

607 OWS at Yongsun AIN, Under Command and Control of 607 ASOG

Area of Responsibility: North and South Korea, and surrounding waters.

Contact Information:

Voice: DSN 315-725-6155, Comm 011-822-7915-6155

Fax: DSN 315-725-7820, Comm 011-822-7915-7820

STU III: Dsn 315-725-7831

Airborne Contact via Phone Patch: DSN 315-725-6155

NIPRNET Homepage: <http://607ws.yongsan.af.mil/>

Contingency Operations:

Voice: DSN 315-742-3172, Comm: 011-822-7913-1110 ext 742-3172

Fax: DSN 315-742-3130

STU-III: DSN 315-742-3173

Airborne Contact via Phone Patch: DSN 315-742-3172

NIPRNET Homepage: http://607ws.yongsan.af.mil

607 OWS Area of Responsibility

Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Kunsan AB	782-4262/4501	725-6155	011-822-7915-6155
Osan AB	784-5630/4377	725-6155	011-822-7915-6155
Cp Humphreys	753-7740	725-6155	011-822-7915-6155
Cp Red Cloud	732-6115	725-6155	011-822-7915-6155
Cp Stanley	732-5417	725-6155	011-822-7915-6155
Cp Stanton	734-5988	725-6155	011-822-7915-6155
Cp Page	721-5325	725-6155	011-822-7915-6155
Cp Eagle	721-2200	725-6155	011-822-7915-6155
Seoul AB	741-6346	725-6155	011-822-7915-6155

e. ALASKA

AIR FORCE

11 OWS at Elmendorf AFB, Under Command Control of 11 AOG

Area of Responsibility: Alaska, including the Aleutians, Arctic Ocean, Canadian provinces of Yukon, Northwest Territories, Nunavut, British Columbia and Alberta.

Contact Information:

Voice: DSN 317-552-2719, Comm 907-552-2719

Fax: DSN 317-552-8351, Comm 907-552-8351

STU III: DSN 317-552-1022

Airborne Contact via Phone Patch: DSN 317-552-2719/3043/5199

NIPRNET Homepage: <http://weather.elmendorf.af.mil>

METEOROLOGICAL INFORMATION C-15

11 OWS Area of Responsibility			
Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Eielson AFB	377-1160/3590	552-2719	907-552-2719
Elmendorf AFB	552-4903/4397	552-2719	907-552-2719
Ft Wainwright	353-7111/7082	552-2719	907-552-2719

f. CARIBBEAN, CENTRAL/SOUTH AMERICA

AIR FORCE

25 OWS at Davis Monthan AFB, Under Command and Control of 12 AF

Area of Responsibility: Mexico, Central & South America, Gulf of Mexico and Caribbean Basin - including the Bahamas Islands.

Contact Information:

Voice: DSN 312-228-1977/2025/2138

Fax: DSN 312-228-1284, Comm 520-228-1284

Toll Free: 1-877-451-8367

STU-III: DSN 312-228-2272

Airborne Contact via Phone Patch: DSN 312-228-1977/2025/2138

NIPRNET Homepage: <http://25ows.dm.af.mil>

SIPRNET Homepage: <http://25ows.davismonthan.af.smil.mil>

25 OWS Area of Responsibility			
Base/Post	Combat Weather Team DSN	Transient Flight Weather Briefings	
		DSN	Commercial
Soto Cano AB	449-4260/4245/6236	228-1977	520-228-1977

NAVY

Guantanamo Bay NS, Cuba
Roosevelt Roads NS,
Puerto Rico

DSN

564-4063 x-6439/6494
831-4578/4017

COMMERCIAL

804-444-4063 x-6439/6493
809-865-4578/4017

g. EASTERN MEDITERRANEAN, SOUTHWEST ASIA, SAUDI ARABIA, SOUTHERN CIS/CASPIAN BASIN

AIR FORCE

28 OWS at Shaw AFB, Under Command and Control of 9 AF

Area of Responsibility: Pakistan, Afghanistan, Iran, Iraq, Jordan, Saudi Arabia, Kuwait, Bahrain, Qatar, United Arab Emirates, Oman, Yemen, Persian Gulf, Red Sea, Egypt, Sudan, Ethiopia, Kenya, Eritrea, Djibouti, & Somalia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, and Caspian Sea.

Contact Information:

Voice: DSN 312-965-0905 ext 259, Comm 803-895-0905

Fax: DSN 312-965-0493/0527, Comm 803-895-0493/0527

STU-III: DSN 312-965-0565

Airborne Contact via Phone Patch: DSN 312-965-0588 ext 259

NIPRNET Homepage: <https://28ows.shaw.af.mil>

SIPRNET Homepage: <http://28ows.shaw.af.smil.mil>

C-16 METEOROLOGICAL INFORMATION

3. PILOT-TO-METRO SERVICE (PMSV), USAF

(AFFSA/AFFSA)

a. The USAF weather units operate a Pilot to Metro Service (PMSV) at selected AFBs and AAFs to provide aircrews a direct contact. "Full Service" facilities are manned by fully qualified personnel. "Limited Service" facilities are manned by individuals not qualified to prepare, issue or interpret forecasts and who will identify themselves as a "weather apprentice." If a forecast or forecast interpretation is required and a fully qualified person is not available, the apprentice will refer the aircrew to a "Full Service" facility. The apprentice may only relay the following information: surface observations, TAFs for which an amendment capability exists, weather watches, warnings, and advisories.

b. Enroute and alternate meteorological watch is the pilot's responsibility. PMSV will be used to the maximum to update forecasts and obtain latest weather observations. Destination meteorological watch is a joint responsibility of the pilot and destination operations section. Operations will notify pilot of adverse weather information as provided by weather personnel.

c. The radio call for PMSV is "METRO", e.g., "Travis METRO". When requesting terminal weather, advise the forecaster/observer of your ETA. For overseas flights, use Global HF System Stations whenever possible (See listing in this Handbook).

4. PILOT-TO-METRO SERVICE (PMSV), USN AND USMC

(NAVFIC/NAVFIC)

a. Pilot-to-Metro Services (PMSV) are available from all Naval Meteorology and Oceanography Command (NAVMETOCOM) and U. S. Marine Corps (USMC) aviation weather activities. The primary purpose of PMSV is for communicating various types of weather information to pilots. PMSV is also used to update the Flight Weather Briefing Form (DD-175-1) and to receive pilot weather reports (PIREPS) of significant or hazardous weather phenomena, which are entered into weather telecommunications networks.

b. Sub-Regional Forecast Center (SRFC) Concept. Under the NAVMETOCOM Sub-Regional Forecast Center (SRFC) concept of operations, forecasting has been centralized to support outlying satellite detachments during off-peak hours, when a forecaster is not on duty. Most NAVMETOCOM and USMC stations are manned 24 hours with observers maintaining a basic weather watch. Observers are authorized to provide basic weather information via PMSV, such as providing the latest field conditions or nearby observation data, or reading a Terminal Aerodrome Forecast (TAF) report. For any requests for forecast services, DD-175-1 updates or extensions, the observer acts as an intermediary between the pilot and SRFC forecaster. Some delay will be experienced in these instances as the SRFC Forecaster receives and processes information for the observer to pass along to the pilot over PMSV. In some cases the SRFC is close enough to a supported satellite detachment for the pilot to radio directly to the SRFC for required assistance.

c. The radio call for PMSV is "METRO", e.g. "Fallon METRO". Advise the forecaster/observer of ETA when terminal weather is requested.

d. SRFC affects the following facilities:

METEOROLOGICAL INFORMATION C-17

<u>NAVY LOCATION</u>	<u>HOURS OF OPERATION</u>	<u>SRFC</u>	<u>REMARKS</u>
Brunswick, ME	H24		
Corpus Christi, TX	H24		SRFC for Kingsville.
Fort Worth, TX	H24 0001-1200Z++	Corpus Christi	Observer is intermediary between the aircraft and SRFC.
Jacksonville, FL	H24		SRFC for Key West and Mayport.
Key West, FL	H24 2230-1030Z++	Jacksonville	Observer is intermediary between the aircraft and SRFC.
Kingsville, TX	H24 0500-1200Z++ Mon-Thu, 0500-1800Z++ Fri-Sun	Corpus Christi	Aircraft are referred to "Corpus Christi Metro" 344.6.
Lemoore, CA	H24		
Mayport, FL	H24 2230-1030Z++	Jacksonville	Observers provide current conditions only. Forecaster service by "Jax Metro" 344.6.
Meridian, MS	H24 0500-1200Z++	Pensacola	Observer is intermediary between the aircraft and SRFC.
New Orleans, LA	H24 0100-1200Z++	Pensacola	Observer is intermediary between the aircraft and SRFC.
Norfolk, VA	H24		
North Island, CA	H24		SRFC for Miramar and El Centro.
Oceana, VA	H24		
Patuxent River, MD	H24		

<u>NAVY LOCATION</u>	<u>HOURS OF OPERATION</u>	<u>SRFC</u>	<u>REMARKS</u>
Pensacola, FL	H24		SRFC for Meridian, New Orleans and Whiting Fld N.
Whidbey Island, WA	H24		
Whiting Fld N, FL	H24 0500-1200Z++ Mon-Fri, H24 Sat-Sun	Pensacola	Aircraft are referred to "Pensacola Metro" 359.6.
Willow Grove, PA	H24 2300-1200Z++	Brunswick	Observer is intermediary between the aircraft and SRFC.

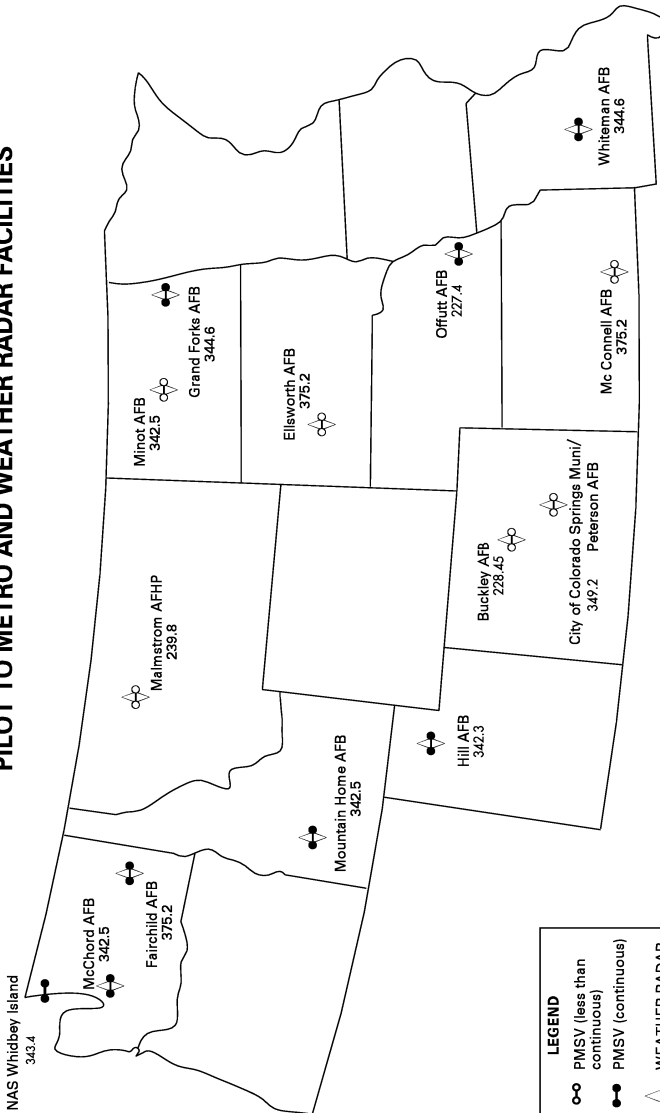
<u>USMC LOCATION</u>	<u>HOURS OF OPERATION</u>
Beaufort, SC	H24

C-18 METEOROLOGICAL INFORMATION

<u>USMC</u> <u>LOCATION</u>	<u>HOURS OF</u> <u>OPERATION</u>
--------------------------------	-------------------------------------

Camp Pendleton, CA	
Cherry Point, NC	H24
Kaneohe Bay, HI	H24
Miramar, CA	H24
New River, NC	H24
Quantico, VA	H24
Yuma, AZ	H24

PILOT TO METRO AND WEATHER RADAR FACILITIES



LEGEND

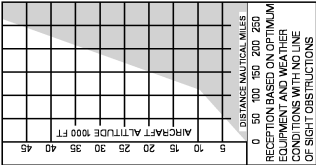
PMSV (less than continuous)

PMSV (continuous)

WEATHER RADAR

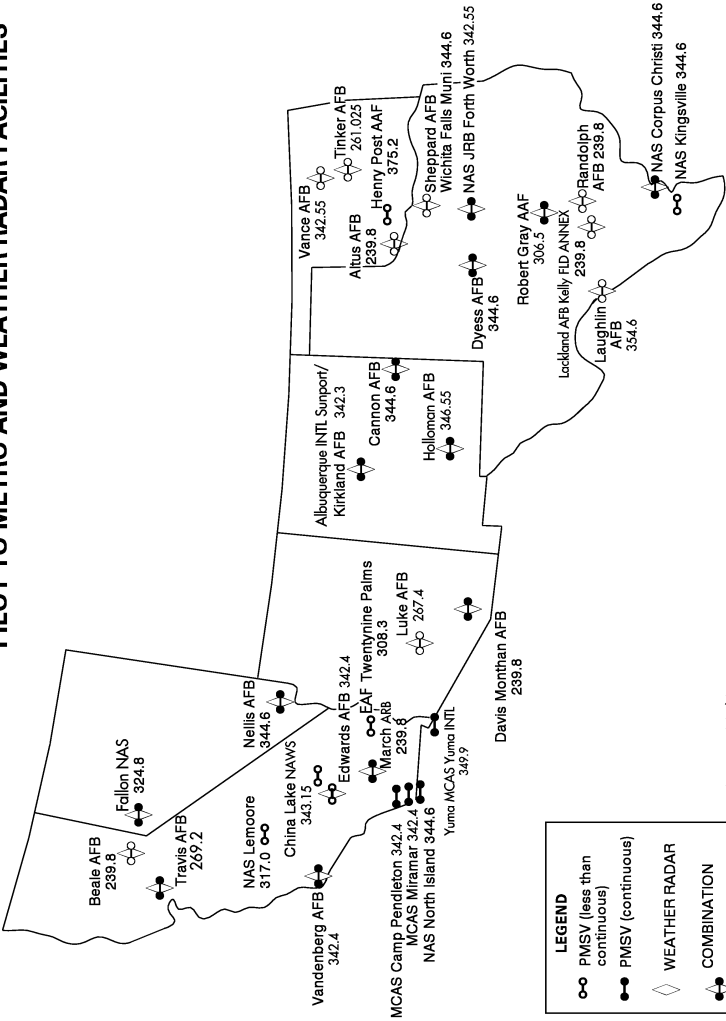
COMBINATION

[OCT 02] (-/-)



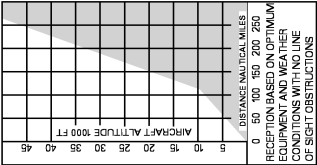
C-20 METEOROLOGICAL INFORMATION

PILOT TO METRO AND WEATHER RADAR FACILITIES



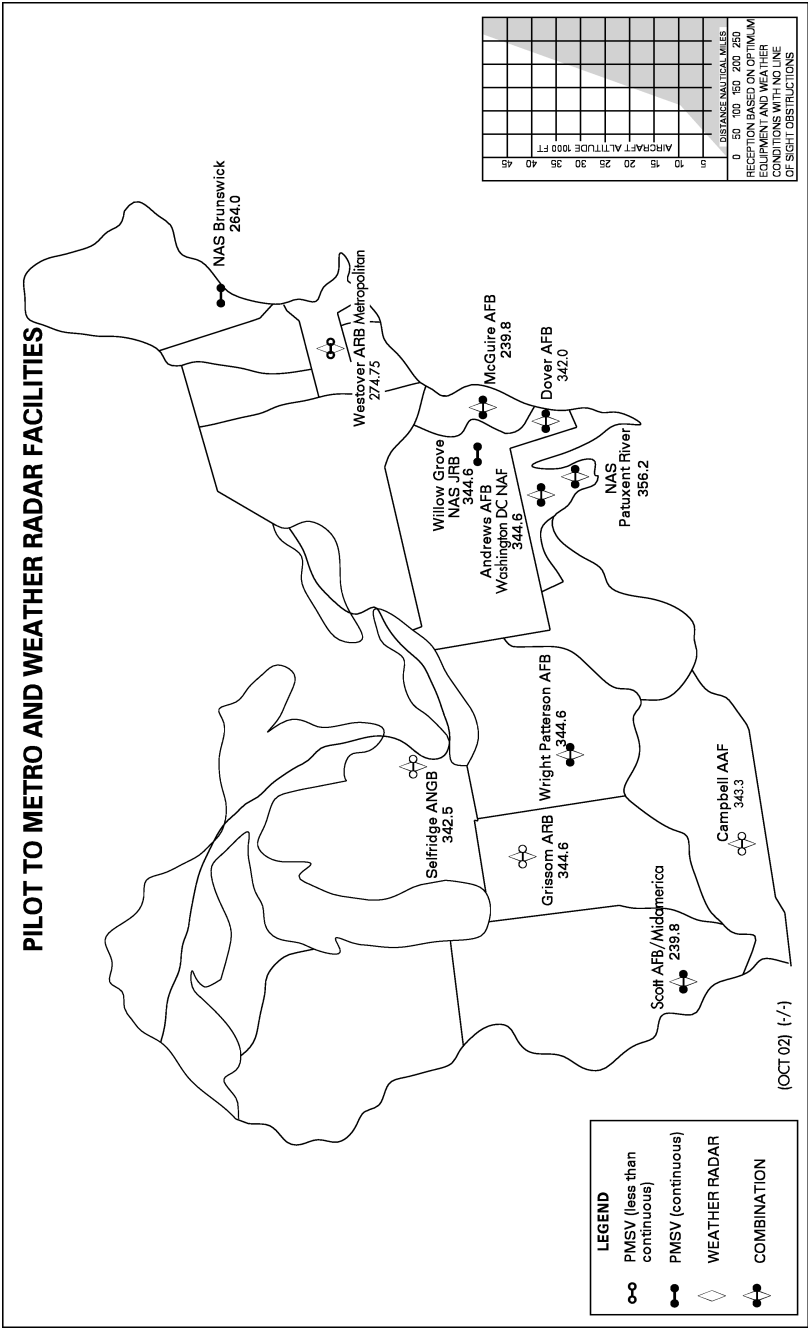
- LEGEND**
- PMSV (less than continuous)
 - PMSV (continuous)
 - ◇ WEATHER RADAR
 - ⊕ COMBINATION

(OCT 02) (-/-)

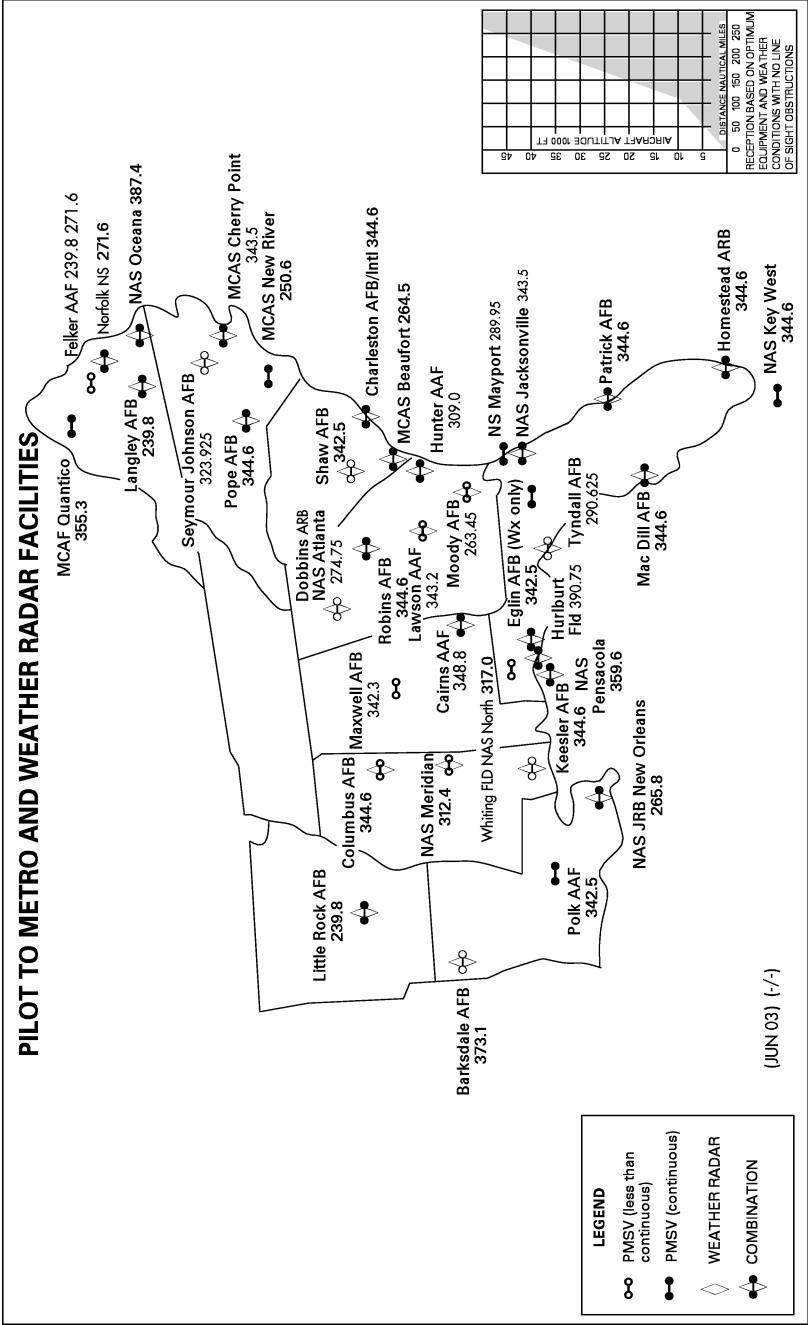


RECEPTION BASED ON OPTIMUM EQUIPMENT AND WEATHER CONDITIONS. MINIMUM ALTITUDE OF SIGHT OBSTRUCTIONS

PILOT TO METRO AND WEATHER RADAR FACILITIES



C-22 METEOROLOGICAL INFORMATION



METEOROLOGICAL INFORMATION C-23

5. PILOT-TO-METRO WEATHER RADAR FACILITIES (DoD Non-CONUS Stations)

Hours are continuous unless otherwise stated in remarks. Consult Enroute Supplement for PMSV frequencies.

*Weather Radar

<u>AREA/FACILITY</u>	<u>REMARKS</u>	<u>CHART/PANEL NO.</u>
1. CARIBBEAN		
CUBA		
Guantanamo Bay NS		H-2F, L-5A, 6F
PUERTO RICO	0900-2100Z Mon-Sat	
Roosevelt Roads NS		T-3H
2. PACIFIC		
ALASKA		
Adak NAF		H-2, L-2
*Eielson AFB		H-1, L-4
*Elmendorf AFB		H-1, L-4
GUAM		
Guam Intl	Joint Civ/Mil airfield.	1B
	Anderson AFB Metro backup.	
*Anderson AFB		1B
HAWAII		
*Hickam AFB		2E
Kaneohe Bay MCAF		2F
JAPAN		
Atsugi NAF		3B, T-1A
*Chitose		3D
Hamamatsu		3A
Iwakuni MCAS		4G
Miho	2200-0800Z Mon-Fri, 2200-0300Z Sat, OT 1 hr prior notice required.	4G
Nyutabaru		4G
*Yokota		3B, T-1A
KOREA		
A-511 (Pyongtaek)		T-1A
*Kunsan AB	Full services	4E
*Osan AB	Full services	T-1A
OKINAWA		5C
Futenma MCAS		
*Kadena AB		5C
3. INDIAN OCEAN		
Diego Garcia NSF		20E, G

C-24 METEOROLOGICAL INFORMATION

AREA/FACILITY	REMARKS	CHART/PANEL NO.
4. EUROPE		
FINLAND		
Helsinki-Vantaa		H-2H, L-1D
Rovaniemi	0300-1900Z++	H-1D, L-1D

METEOROLOGICAL INFORMATION C-25



C-26 METEOROLOGICAL INFORMATION

6. VOLMET VOICE WEATHER BROADCASTS

Meteorological information for aircraft in flight may be obtained through routine and special VHF and HF weather broadcasts. VHF broadcasts are normally continuous and contain current airport weather reports, with trend parts where available, and occasionally SIGMET information. HF broadcasts are normally scheduled at regular intervals and contain current airport reports, with trend parts where available, and airport forecasts.

A - ACTUAL WEATHER REPORT

F - LANDING FORECAST

S - SIGMET

T - FORECAST TREND TYPE

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>		<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
ALGER				
126.8	0500-2200Z	H+10 & H+40	A	ALGER, ANNABA, CONSTANTINE, ORAN, TUNIS, MADRID, BARCELONA, PALMA, MARSEILLE, NICE.
ALICANTE				
126.0	H24	Continuous	AT	BARAJAS, PALMA DE MALLORCA, MALAGA, VALENCIA, ALICANTE, IBIZA, GRANADA, ALGER, ORAN.
AMSTERDAM				
126.20	H24	Continuous	AT	AMSTERDAM, ROTTERDAM (T IF AVAILABLE), BRUSSELS, DUSSELDORF, HAMBURG, COPENHAGEN, HEATHROW, GATWICK, CHARLES DE GAULLE. Weather reports may be obtained on request on freqs: 123.70, 123.85, 124.30, 124.875, 125.75, 129.30, 133.1 MHZ.
ANCHORAGE				
2863	H24	H+25-30 & H+55-00	AT	ANCHORAGE, FAIRBANKS, COLD BAY, VANCOUVER.
6679	H24			
8828	H24		A	ELMENDORF AFB, KING SALMON.
13282	H24			
ANDERSEN				
18002	2200-0700Z	H+15 & H+45	A	ANDERSEN, KADENA, YOKOTA.
13201	2000-0900Z			
11176	H24			
8967	H24			
6738	0700-2200Z			
4721	0900-2000Z			
ANKARA				
127.0	H24	Continuous	AT	ESENBAGA, ATATURK, ADNAN MENDERES, BEIRUT INTL.

METEOROLOGICAL INFORMATION C-27

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>	<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
ASUNCION			
5601 10067	0905-2315Z	H+05 H+15	AFST SILVIO PETTIROSSI INTL.
		AFT*	BASE 5 GENERAL ADRAIN JARA, TENTIENTE COL. CAMELO PERALTA, ENCARNACION, DR. LUIS MARIA ARGANA, CARLOS MIGUEL JIMENEZ, SAN JUAN BAUTISTA, VILLARRICA, BAHIA NEGRA, LA VICTORIA, POZO COLORADO, CAPITAN EMILO NUDDLEMAN, SAN ESTANISLAO, SAN PEDRO. *Every 3 hours and if necessary every hour.
ATHINAI			
127.8	H24	Continuous	AT ANDRAVIDA, ATHINAI, CAIRO INTL, NIKOS KAZANTZAKIS, ATUTURK, IOANNIS KAPODISTRIAS, LARNACA, DIGORAS, MAKEDONIA.
AUCKLAND			
6679 8828 13282	H24 H24 H24	H+20+H-25 H+50+H-55	AFT AUCKLAND, CHRISTCHURCH WELLINGTON, NADI, FALEOLO, NOUMEA, PAGO PAGO, TAHITI. AFT AUCKLAND, CHRISTCHURCH WELLINGTON, NADI, FALEOLO, NOUMEA, PAGO PAGO, TAHITI.
BAGHDAD			
125.0 132.88	H24 H24	H+00-05 & Special	AFST SADDAM INTL.
BANGKOK			
11387 6676	2310-1145Z H24	H+10-15 & H+40-45	S* AT BANGKOK INTL
2965	1210-2245Z	H+10-15 & H+40-45	AT BANGKOK INTL, CHIANG MAI INTL, HAT YAI INTL, NOIBAI INTL, PHUKET INTL, SEPANG KUALA LUMPUR INTL, U TAPHAO INTL, YANGON INTL *As avbl
BARCELONA			
127.6	H24	Continuous	AT BARAJAS, BARCELONA, PALMA DE MALLORCA, MALAGA, IBIZA, GIRONA, MENORCA, TOULOUSE, MARSEILLE.
BEIJING			
*13285 *8849 **5673 **3458	0000-1600Z	H+15 - H+20 H+45 - H+50	AFST CAPITAL, ZHOUSHUIZI, HONGQUIAO, TAOXIAN, WUSU, BINHAI. *Day **Ngt

C-28 METEOROLOGICAL INFORMATION

FACILITY/FREQUENCY		TIME	TYPE	AIRPORTS SERVICED
BEIRUT				
126.0	H24	Continuous	AT	BEIRUT INTL, NICOSIA, DAMASCUS INTL, QUEEN ALIA INTL, CAIRO INTL, SADDAM INTL, KUWAIT INTL, ATATURK, BAHRAIN INTL, ESENBOGA, MEHRABAD INTL.
3001	H24	H+15 & H+45	F	BEIRUT INTL.
5561	H24		A	BEIRUT INTL, DAMASCUS INTL, NICOSIA, KING ABDUL AZIZ INTL, CAIRO INTL.
8819	H24		AF	BEIRUT INTL.
BELEM METRO				
6603	H24	Continuous	AT	CONCEICAO DO ARAGUAIA, TROMBETAS,TIRIOS.
10057			AFT	AMAPA, VAL DE CAES INTL, CAROLINA, CARAJAS, ALTAMIRA, IMPERATRIZ, MARABA, MONTE DOURADO, MACAPA, OIAPOQUE, MARECHAL CUNHA MACHADO, SANTAREM, TUCURUI
13352			S*	BELEM FIR. *This MET information will be provided for enroute aircraft where MET phenomena are forecast or observed.
BEOGRAD				
126.4	H24	Continuous	AF	BEOGRAD, ZAGREB, DUBROVNIK, WIEN, BUDAPEST, BUCHAREST, SOFIA, THESSALONIKI.
BERLIN				
128.4		Continuous	AF	SCHONEFELD, TEMPELHOF, TEGEL, DRESDEN*, LEIPZIG/HALLE, PRAHA, COPENHAGEN, WARSZAWA, WEIN *(Trend forecast available).
BLOEMFONTEIN				
130.3	0400-1800Z	Continuous	AT	BLOEMFONTEIN*, CAPE TOWN*, EAST LONDON, JAN SMUTS*, KIMBERLEY, PORT ELIZABETH*, UPINGTON, DURBAN, MASERU, GEORGE. *Trend.
BODO*				
124.25	H24	Continuous	AST	BODO, EVENES, ANDOYA, BARDUFOSS, TROMSO, ALTA, TRONDHEIM/VAERNES, OSLO/GARDERMOEN. *English and Scandinavian language.

METEOROLOGICAL INFORMATION C-29

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>	<u>TYPE</u>	<u>AIRPORTS SERVICED</u>	
BORDEAUX				
126.4	H24	Continuous	A	GENEVA/COINTRIN, MERIGNAC, BLAGNAC, BARAJAS, BARCELONA, LISBOA, CHARLES DE GAULLE, ORLY, PALMA DE MALLORCA.
			S	SIGMET NOTICES FROM THE BORDEAUX FIR and FRANCE UIR.

BRASILIA METRO

132.6	H24	Continuous	AT	ARARAQUARA, ARAXA, BASE DE AVIACAO DE TAUBATE BORGES, CABO FRIO, CARLOS PRATES, CHAFEI AMSEI, FRONTEIRA, FURNAS, GOVERNADOR VALADARES, HELP SAO TOME, HIDROELETRICA, LAGOA SANTA, MAJOR BRIGADEIRO DOORGAL BORGES, MAJOR BRIGADEIRO TROMPOWSKY, MARTE, MINACU, MONTES CLAROS, POCOS DE CALDAS, PORTO NACIONAL, SAO JOSE DO RIO PRETO, UMBERTO MODIANO, USIMINAS.
132.4			AFT	ANNAPOLIS, BARRA DO GARCAS, BARTOLOMEU LISANDRO, CAMPO DELIO JARDIM DE MATTIOS, CAMPO FONTENELLE, CONGONHAS, DEPUTADO LUIS EDUARDO MAGLHAES, FRANCISCO DE ASSIS, GALEAO-ANTONIO CARLOS JOBIM, GOIABEIRAS, GUARATINGUETA, GUARULHOS, JACAREPAGUA, LEITE LOPES, MACAE, MARECHAL CUNHA MACHADO, MARECHAL RONDON, PAMPULHA, PRESIDENTE JUSCELINO KUBITSCHKE, SANTA CRUZ, SANTA GENOVEVA, SANTOS DUMONT, SAO PEDRO DA ALDEIA, TANCREDO NEVES, TOCANTINS, UBERABA, UBERLANDIA, VIRACOPOS
132.2			S*	BRASILIA FIR *This MET information will be provided for enroute aircraft where MET phenomena are forecast or observed.

BRATISLAVA

126.2	0500-2030Z++	Continous	AT	M R STEFANIK, RUZYNE, KOSICE, SLIAC, TATRY, PIESTANY, ZILINA, MOSNOV.
-------	--------------	-----------	----	---

BRAZZAVILLE*

10057	0700-2000Z	H+00 & H+25	AFST	BRAZZAVILLE, NDJAMENA, DOUALA, BANGUI, LIBREVILLE, YAOUNDE.
10057	2000-0700Z	H+30 & H+55	AFST	KINSHASA, KANO, LAGOS, LUANDA. *English and French language

C-30 METEOROLOGICAL INFORMATION

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>		<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
BRINDISI				
127.6	H24	Continuous	S A AT	BRINDISI. CIAMPINO. BRINDISI, PISA, ROMA/FIUMICINO, CAPODICHINO, ATHINAI, THESSALONIKI, KERKIRA, ANDRAVIDA.
BRUSSELS				
127.80	H24	Continuous	AT	BRUSSELS NATIONAL, OOSTENDE, HEATHROW, LUXEMBOURG, SCHIPHOL, ORLY, FRANKFURT, KOLN-BONN, DUSSELDORF.
BUCURESTI				
126.8	H24	Continuous	AT	BANEASA, BEOGRAD, BUDAPEST, GIARMATA, ISTANBUL, KIEV, M. KOGALNICEANU, OTOPENI, SOFIA.
129.4	H24	Continuous	S	BUCURESTI FIR.
BUDAPEST				
127.4	HS24	Continuous	T	BUDAPEST, PRAHA, BRATISLAVA, ARAD, BUCURESTI/O, BEOGRAD, SOFIA, WARSAWA, WIEN
CAIRO				
126.2	H24	H+10, 20, 30, 40, 50	AT F	CAIRO INTL. CAIRO INTL.
CALCUTTA				
11387 6676 2965	H24 (0300-1300Z) (1300-0300Z)	H+05-10 & H+35-40	AFT AT	CALCUTTA, MUMBAI, DELHI. DHAKA, RANGOON.
CASABLANCA				
127.6	H24	Continuous	AT A	MOHAMED V, SALE, BOUKHALF, MENARA, INEZGANE. ANGADS, GRAN CANARIA, MALAGA, SEVILLA.

METEOROLOGICAL INFORMATION C-31

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>	<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
---------------------------	-------------	-------------	--------------------------

COMODORO RIVADAVIA RADIO

4675	0900-2400Z	H+30	A*	COMODORO RIVADAVIA, RIO GALLEGOS, TRELEW, AEROPARQUE JORGE NEWBERY, BARILOCHE, BAHIA BLANCA.
8938	0900-2400Z	H+30	F*	VIDEIMA, ESQUEL, LAGO ARGENTINO, SAN JULIAN SAN ANTONIO OESTE, PERITO MORENO, GOBERNADOR GREGORES, PUERTO DESEADO SANTA CRUZ, RIO GRANDE, MAQUINCHAO, PASO DE INDIOS, USHUAIA, EL MAITEN, EL BOLSON, ALTO RIO SENGUER, JOSE DE SAN MARTIN, RIO MAYO, RIO TURBIO.
		H+40	ST	COMODORO RIVADAVIA FIR*, EZEIZA FIR**. *Every hour. **Every Even Hour. NOTE: Broadcast of any information depends upon availability.

COPENHAGEN

127.0	H24	Continuous	AFT	KASTRUP, BILLUND, AALBORG, HAMBURG, MALMO, GOTEBOG, ARLANDA, OSLO, STAVANGER.
-------	-----	------------	-----	---

CORDOBA RADIO

5475	H24	H+25	A*	CORDOBA, JUJUY, SALTA, TUCUMAN, MENDOZA.
8952	H24	H+25	F*	ORAN, LA RIOJA, CATAMARCA, CERES, RIO CUARTO, MARCOS JUAREZ, TARTAGAL, VILLA DOLORES, CHILECITO, SAN JUAN, SAN LUIS, VILLA REYNOLDS, SAN RAFAEL, MALARGUE, SAN MARTIN, AEROPARQUE JORGE NEWBERY, SAUCE VIEJO, ROSARIO.
			ST	CORDOBA FIR*, MENDOZA FIR**, EZEIZA FIR***. *Every Hour. **Every Even Hour. ***Every Odd Hour. NOTE: Broadcast of any information depends upon availability.

C-32 METEOROLOGICAL INFORMATION

FACILITY/FREQUENCY		TIME	TYPE	AIRPORTS SERVICED
CURITIBA METRO				
132.05 (S sctr) H24		Continuous	AT	ARACATUBA, ASSIS, CAMPO DOS BUGRES, CASCAVEL, CHAPECO, FORQUILHINHA, LAGES, LAURO KURTZ, LINS, RIO GRANDE, SANTO ANGELO, TANCREDO THOMAS DE FARIA, TELEMACO BORBA, TOLEDO, URUBUPUNGA, USINA PORTO PRIMAVERA.
132.45 (N sctr)			ATF	AFONSO PENA, BACACHERI, BAURU, CAMPO GRANDE, CANOAS, CATARATAS INTL, COMANDANTE GUSTAVO KRAEMER, CORUMBA INTL, HERCILIO LUZ, JOINVILLE, LONDRINA, MINISTRO VICTOR KONDER, PELOTAS, PONTA PORA, PRESIDENTE PRUDENTE, RUBEM BERTA, SALGADO FILHO, SANTA MARIA (SBSM).
			S	CURITIBA FIR.
DAMASCUS				
2992	H24	H+30 & Special	AFT	DAMASCUS INTL.
5667	H24	H+00 & Special	AFT*	ALEPPO INTL.
8918	H24			*+30 O/R.
13312	H24	H+00 & Special	A	DEIR ZZOR, KAMISHLY, PALMYRA.
DUBLIN				
127.0	H24	Continuous	AFT	DUBLIN, SHANNON, CORK, BELFAST, GLASGOW, PRESTWICK, MANCHESTER, HEATHROW, GATWICK.
EDMONTON MILITARY				
6753	2300-1200Z	EVEN HRS+20	A	NAMAO, VANCOUVER, WINNIPEG, COMOX,
15035	1200-2300Z	SSB, Voice only		COLD LAKE, CALGARY INTL, RESOLUTE BAY, CAMBRIDGE BAY, CHURCHILL, YELLOWKNIFE, WHITEHORSE, THULE AFB.
			F	RESOLUTE BAY*, CAMBRIDGE BAY*, CHURCHILL*, YELLOWKNIFE*, WHITEHORSE*, THULE AFB*.
		ODD HRS+20 SSB, Voice only	F	NAMAO, VANCOUVER WINNIPEG, COMOX, COLD LAKE, CALGARY INTL, RESOLUTE BAY*, CAMBRIDGE BAY*, CHURCHILL*, YELLOWKNIFE*, WHITEHORSE*, THULE AFB*.
EKOFISK				
118.975	0500-1700Z		AS	STAVANGER/SOLA, HAUGESUND/ KARMØY, FARSUND/LISTA.

METEOROLOGICAL INFORMATION C-33

FACILITY/FREQUENCY		TIME	TYPE	AIRPORTS SERVICED
EZEIZA RADIO				
2881	H24	H+15	A*	AEROPARQUE JORGE NEWBERY, ROSARIO, MAR DEL PLATA, NEUQUEN, BAHIA BLANCA, BARILOCHE, SAUCE VIEJO, PORTO ALEGRE (Brazil), MONTEVIDEO (Uruguay), ASUNCION (Paraguay), PUDAHUEL (Chile), ANTOFAGASTA (Chile).
5601	H24			
11369	H24			
		H+15	A**	CORDOBA, JUJUY, SALTA, TUCUMAN, MENDOZA.
		H+15	A***	RESISTENCIA, CORRIENTES, POSADAS, CATARATAS DEL IGUAZU, COMODORO RIVADAVIA, TRELEW, RIO GALLEGOS.
		H+15	F*	EL PALOMAR, PARANA, GUALEGUAYCHU, LABOULAYE, JUNIN, SANTA ROSA, TANDIL, CONCORDIA, GENERAL PICO, DON TORCUATO, LA PLATA, AZUL, DOLORES, NECOCHEA, PEHUAJO.
		H+15	F**	ORAN, LA RIOJA, CATAMARCA, CERES, RIO CUARTO, MARCOS JUAREZ, TARTAGAL, VILLA DOLORES, CHILECITO, SAN JUAN, SAN LUIS, VILLA REYNOLDS, SAN RAFAEL, MALARGUE, SAN MARTIN.
		H+15	F***	PRESIDENCIA ROQUE SANEZ PENA, FORMOSA, RECONQUISTA, MONTE CASEROS, PASO DE LOS LIBRES, CURUZU CUATIA, GOYA, VIEDMA, ESQUEL, LAGO ARGENTINO, SAN JULIAN, SAN ANTONIO OESTE, PERITO MORENO, GOBERNADOR GREGORES, PUERTO DESEADO, SANTA CRUZ, RIO GRANDE, MAQUINCHAO, PASO DE INDIOS, USHUAIA, EL MAITEN, EL BOLSON, ALTO RIO SENGUER, JOSE DE SAN MARTIN, RIO MAYO, RIO TURBIO.
		H+01	ST	EZEIZA FIR*, COMODORO RIVADAVIA. FIR**, RESISTENCIA FIR***. *Every Hour. **Every Even Hour. ***Every Odd Hour.
NOTE: Broadcast of any information depends upon availability.				

FRANKFURT 1

127.6	H24	Continuous	AFT	FRANKFURT, BRUSSELS, AMSTERDAM, ZURICH, GENEVA, BALE-MULHOUSE, WIEN, PRAHA, CHARLES DE GAULLE.
-------	-----	------------	-----	--

FRANKFURT 2

135.775		Continuous	AF	FRANKFURT, KOLN/BONN, DUSSELDORF, STUTTGART*, NURNBERG*, MUNCHEN, HAMBURG, TEMPELHOF, TEGEL *(Trend forecast available).
---------	--	------------	----	--

C-34 METEOROLOGICAL INFORMATION

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>	<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
GANDER			
3485	H24	H+20-25	F MONTREAL/Mirabel, TORONTO, OTTAWA.
6604	H24		A MONTREAL/Mirabel, TORONTO, GANDER, OTTAWA, GOOSE.
10051	H24	H+25-30	FS(1*) WINNIPEG, EDMONTON, CALGARY, CHURCHILL.
13270	H24		A KUUJJUAQ, WINNIPEG, CHURCHILL.
		H+50-55	F GANDER, ST JOHNS, HALIFAX.
			A MONTREAL/Mirabel, STEPHENVILLE, GANDER, HALIFAX, ST JOHNS.
		H+55-60	FS(1*) GOOSE, IQALUIT, SONDRESTROM.
			A GOOSE, IQALUIT, SONDRESTROM, KUUJJUAQ.
			1* Includes SIGMET or notification of SIGMET affecting flights operating above FL 100 in the Gander Oceanic and the Gander, Moncton, Montreal and Toronto domestic FIR.
GENEVA			
126.8	H24	Continuous	A COINTRIN, ZURICH, BALE/MULHOUSE, NICE, SAINT EXUPERY, CHARLES DE GAULLE, ORLY, LINATE, MALPENSA.
HANNOVER (BREMEN VOLMET)			
127.4	H24	Continuous	AF HANNOVER*, HAMBURG, BREMEN*, KOLN/BONN, FRANKFURT, TEMPELHOF, TEGEL, AMSTERDAM, COPENHAGEN *(Trend forecast available).
HARARE			
113.1	0400-1800Z	Continuous	A HARARE.
HELSINKI-VANTAA			
128.4	H24	Continuous	AT HELSINKI, ST PETERSBERG/PULKOVO, ARLANDA, TALLIN/YULEMIST.
			A OULU*, VAASA*, TAMPERE/PIRKKALA, TURKU KUOPIO*.
			*Hourly only.
HONG KONG			
128.875	H24	Continuous	A SHENZHEN,TAIPEI
			AT MACAU, GAOXIONG
2863	H24	H+15-20 &	A NAHA
6679		H+45-50	AT HONG KONG INTL,
8828			GUANGZHOU/BAIYUN, CHIANG KAI
13282			SHEK INTL, GAOXIONG, NINOY AQUINO INTL, MACTAN
			F HONG KONG INTL
338	H24	H+15-20 & H+45-50	ST HONG KONG INTL

METEOROLOGICAL INFORMATION C-35

FACILITY/FREQUENCY		TIME	TYPE	AIRPORTS SERVICED
HONOLULU				
2863	H24	H+00-05 &	A	HONOLULU, HILO, AGANA, KAHULUI.
6679	H24	H+30-35	F	HONOLULU, HILO, AGANA.
8828	H24		S	HONOLULU FIR.
13282	H24	H+05-10 &	A	SAN FRANCISCO, SEATTLE, LOS
		H+35-40		ANGELES, PORTLAND, SACRAMENTO,
				ONTARIO, LAS VEGAS.
			F	SAN FRANCISCO, SEATTLE, LOS
				ANGELES.
			S	HONOLULU FIR.
		H+25-30 &	A	ANCHORAGE, FAIRBANKS, COLD BAY,
		H+55-60		VANCOUVER, ELMENDORF, KING
				SALMON.
			F	ANCHORAGE, FAIRBANKS, COLD BAY,
				VANCOUVER.
INNSBRUCK				
130.475	H24	Continuous	AFST	MUNCHEN, ZURICH, ALTENRHEIN,
				FRIEDRICHSHAFEN, HOHENEMS, ALPE
				RAUZ, PATSCHERKOFEL, GERLOS,
				KUFSTEIN, ZELL AM SEE, BOLZANO/
				BOZEN.
	0250-2250Z++	Continuous	AFST	INNSBRUCK, * SALZBURG*,
				KLAGENFURT*, LINZ.*
				*During operational hours.
ISTANBUL				
127.4	H24	Continuous	AT	ATATURK, ESENBAGA, ADNAN
				MENDERES, ATHENS, SOFIA,
				BUCHAREST.
JONKOPING*				
127.2	H24	Continuous	AFT	ARLANDA, STURUP.
			AF	BROMMA, LANDVETTER**, VISBY,
				JONKOPING, KARLSTAD, ANGELHOLM,
				RONNEBY, KALMAR.
			A	HALMSTAD
				*The transmission is controlled from
				ARLANDA.
				**Available 0500-1800Z++.
				NOTE: Information updated H+05 & H+35
KARACHI				
6680	H24	H+15 & H+45	A	KARACHI CIVIL, NAWABSHAH, LAHORE.
3432	1500-0130Z			
10017	0130-1500Z			

C-36 METEOROLOGICAL INFORMATION

FACILITY/FREQUENCY		TIME	TYPE	AIRPORTS SERVICED
KLAGENFURT				
122.275	H24	Continuous	AFST	KLAGENFURET*, GRAZ*, ZEL am SEE, FELBERTAUERN, LAVANT bei LIENZ, SPITTAL/DRAU, NEUMARKTER SATTEL, SONNBLICK, MAUTERNDORF, SCHOBERPAL, 2 ZELTWEIG*, AIGEN/ ENNSTAL*. *During operational hours.
KUWAIT				
126.625	H24	Continuous	AFST	BAHRAIN, DOHA, ABU DHABI, DUBAI, RIYADH, DAMMAM, TEHRAN, MASHHAD, SHIRAZ
LAJES				
13244 8967 6750	1000-2100Z H24 H24	H+00 & H+30	T	LAJES, MILDENHALL, RAMSTEIN, RHEIN MAIN.
LA PAZ				
8070	1015-2315	H+15	A	ASCENSION DE GUARAYOS, COBIJA, COCHABAMBA, EL TROMPILLO, GUAYARAMERIN, LAPAZ, MAGDALENA, ORURO, PUERTO SUAREZ, RIBERALTA, ROBORE, RURRENABAQUE, SAN BORJA, SAN IGNACIO DE MOXOS, SAN IGNACIO DE VELASCO, SANTA ANA, SUCRE, TARIJA, TRINIDAD, VIRU VIRU, YACUIBA.
LAS PALMAS				
126.2	H24	Continuous	AT	GRAN CANARIA, TENERIFE NORTE, TENERIFE SUR, FUERTEVENTURA, LANZAROTE, CASABLANCA, MARRAKECH, AGADIR, BARAJAS, LISBOA.
LIBREVILLE*				
112.1	0700-1800Z	Continuous	AT	LIBREVILLE. *English and French language. NOTE: Information update H+00 & H+30.
LISBOA				
126.4	H24	Continuous	AST A	LISBOA. PORTO, FARO, SEVILLA, BARAJAS, GRAN CANARIA, TENERIFE SUR, FUNCHAL, PORTO SANTO.
LONDON (MAIN)				
135.375	H24	Continuous	AT	AMSTERDAM, BRUSSELS, CHARLES DE GAULLE, DUBLIN, GATWICK, GLASGOW, HEATHROW, MANCHESTER, STANSTED.

METEOROLOGICAL INFORMATION C-37

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>		<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
LONDON (NORTH)				
126.6	H24	Continuous	AT	BLACKPOOL, EAST MIDLANDS, GATWICK, LEEDS BRADFORD, LIVERPOOL, MANCHESTER, NEWCASTLE, RONALDSWAY, TEESIDE.
LONDON (SOUTH)				
128.6	H24	Continuous	AT	BIRMINGHAM, BOURNEMOUTH, BRISTOL, CARDIFF, JERSEY, LUTON, NORWICH, SOUTHAMPTON, SOUTHEND.
MACDILL				
18019	0900-2400Z	H+15 & H+45	A	ANDREWS, CHARLESTON, DOVER, MCGUIRE, POPE.
13244	0900-2400Z			
11246	H24			
8993	H24			
6750	0001-0900Z			
4746	0001-0900Z			
MADRID				
126.2	H24	Continuous	AT	BARAJAS, BARCELONA, SEVILLA, MALAGA, VALENCIA, ALICANTE, BILBAO, LISBOA, BORDEAUX.
MALTA				
126.8		Continuous	AT	ROME, NAPLES, PALERMO, CATANIA, TUNIS, TRIPOLI, BENGHAZI, MALTA
MANAUS METRO				
132.40	H24	Continuous	AT	CACHIMBO, JACAREACANGA, ITACOATIARA, ITAITUBA, SAO GABRIEL DA CACHOEIRA.
			AFT	ALTA FLORESTA, BOA VISTA, EDUARDO GOMES INTL, PONTA PELADA, MANICORE, TEFE, BAURU.
			S*	MANAUS FIR. *This MET information will be provided for enroute aircraft where MET phenomena are forecast or observed.
MARSEILLE				
127.4	H24	Continuous	A	PROVENCE, LINATE, COTE D'AZUR, SAINT EXUPERY, GENEVA/COINTRIN, CHARLES DE GAULLE, BARCELONA, ROME/FIUMICINO, PALMA DE MALLORCA.
			S	SIGMET notices from the MARSEILLE FIR and FRANCE UIR.

C-38 METEOROLOGICAL INFORMATION

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>		<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
MILANO				
126.6	H24	Continuous	S A AT	MILANO. TORINO, GENOVA/SESTRI, FIUMICINO. LINATE, MALPENSA, VENEZIA/TESSERA, PISA, ROMA/FIUMICINO, NICE/COTE D'AZUR.
MONTEVIDEO				
8873 5451	1000-2100Z	H+15	AFST AFT	CARRASCO INTL. ANGEL S ADAMI, ARTIGAS, CAPT. CORBETA CC CURBELO, CERR LARGO, COLONIA, EL JAGUEL, RIVERA.
MUMBAI				
11387 6676 2965	H24 H24	H+25-30 & H+55-00	AFT AT	MUMBAI, COLOMBO/KATUNAYAKE INTL. CHENNAI, KARACHI CIVIL, AHMEDABAD. (T-only 0110-1610Z).

METEOROLOGICAL INFORMATION C-39

FACILITY/FREQUENCY		TIME	TYPE	AIRPORTS SERVICED
NEW YORK				
3485	H24	H+00-05	A	DETROIT, CHICAGO, CLEVELAND, NIAGARA FALLS, MILWAUKEE, INDIANAPOLIS.
6604	H24			
10051	H24		F	DETROIT, CHICAGO, CLEVELAND.
13270	H24	H+05-10	A	BANGOR, PITTSBURGH, WINDSOR LOCKS, ST LOUIS, CHARLOTTE, MINNEAPOLIS.
			F	BANGOR, PITTSBURGH, CHARLOTTE.
			S	NEW YORK FIR.
		H+10-15	A	NEW YORK, NEWARK, BOSTON, BALTIMORE, PHILADELPHIA, WASHINGTON.
			F	NEW YORK, NEWARK, BOSTON.
		H+15-20	A	BERMUDA, MIAMI, NASSAU, FREEPORT, TAMPA, WEST PALM BEACH, ATLANTA.
			F	BERMUDA, MIAMI, ATLANTA.
			S	MIAMI/SAN JUAN FIR.
		H+30-35	A	DETROIT, CHICAGO, CLEVELAND, NIAGARA FALLS, MILWAUKEE, INDIANAPOLIS.
			F	NIAGARA FALLS, MILWAUKEE, INDIANAPOLIS.
		H+35-40	A	BANGOR, PITTSBURGH, WINDSOR LOCKS, ST LOUIS, CHARLOTTE, MINNEAPOLIS.
			F	WINDSOR LOCKS, ST LOUIS.
			S	NEW YORK FIR.
		H+40-45	A	NEW YORK, NEWARK, BOSTON, BALTIMORE, PHILADELPHIA, WASHINGTON.
			F	BALTIMORE, PHILADELPHIA, WASHINGTON.
		H+45-50	A	BERMUDA, MIAMI, NASSAU, FREEPORT, TAMPA, WEST PALM BEACH, ATLANTA.
			F	NASSAU, FREEPORT.
			S	MIAMI/SAN JUAN FIR.
NICOSIA				
127.2	H24	Continuous		LARNACA, ATHINAI, RODOS/PARADISI, BEIRUT INTL, DAMASCUS INTL, ESENBAGA, ATATURK, BEN GURION, PAPHOS.
OAKLAND				
2863	H24	H+05-10 &	AT	SAN FRANCISCO, LOS ANGELES, SEATTLE.
6679	H24	H+35-40	T	SACRAMENTO, ONTARIO, LAS VEGAS.
8828	H24		S*	SAN FRANCISCO, SALT LAKE CITY.
13282	H24			*To be included in the broadcasts only if time available.

C-40 METEOROLOGICAL INFORMATION

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>		<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
OSLO				
128.6	H24	Continuous	AT	BERGEN/FLESLAND, LANDVETTER, KASTRUP, KRISTIANSAND/KJEVIK, OSLO/GARDERMOEN, STAVANGER/SOLA, ARLANDA, TRONDHEIM/VAERNES.
PARIS				
126.0	H24	Continuous	A	CHARLES DE GAULLE, ORLY, GATWICK, SAINT EXUPERY, ZURICH, GENEVA/COINTRIN, BRUSSELS NATIONAL, HEATHROW, SCHIPHOL.
			S	SIGMET notices from the BREST, REIMS, PARIS FIRS and FRANCE UIR.
PISA				
128.4	H24	Continuous	S	PISA.
			A	BOLOGNA, RONCHI DEI LEGIONARI.
			AT	PISA, VENEZIA/TESSERA, RIMINI, ZURICH, GENEVE, BALE/MULHOUSE, MUNCHEN.
PORTO VELHO METRO				
132.30	H24	Continous	AT	GUAJARA-MIRIM
			AFT	CRUZEIRO DO SUL, PORTO VELHO, PRESIDENTE MEDICI, TARAUACA, TABATINGA, VILHENA
			S*	PORTO VEHLO FIR. *This MET information will be provided for enroute aircraft where MET phenomena are forecast or observed.
PRAHA				
128.6	H24	Continuous	A	SCHONEFELD, M R STEFANIK, FERIHEGY, FRANKFURT MAIN, MUNCHEN, RUZYNE, OKECIE, ZURICH.
			S	PRAHA FIR.
125.525	H24	Continuous	A	TURANY, CESKE BUDEJOVICE, KARLOVY VARY, MOSNOV, PARDUBICE, RUZYNE, KUNOVICE.* *Available 0500-1500Z++ Mon-Fri.
			S	PRAHA FIR.
RECIFE METRO				
123.95	H24	Continuous	AT	CARIRI, SEPT ROSADO, PARNAIBA, PAULO AFONSO
124.90	H24			

METEOROLOGICAL INFORMATION C-41

FACILITY/FREQUENCY TIME TYPE AIRPORTS SERVICED

AFT SANTA MARIA, CARAVELAS, FERNANDO DE NORONHA, PINTO MARTINS INTL, ILHEUS, PRESIDENTE CASTRO PINTO, JOAO SUASSUNA, BOM JESUS DA LAPA, ZUMBI DOS PALMARES, AUGUSTO SERVO, PETROLINA, PORTO SEGURO, VITORIA DA CONQUISTA, GUARARAPES, DEPUTADO LUIS EDUARDO MAGALHAES, TERESINA

S* RECIFE FIR.
*This MET information will be provided for enroute aircraft where MET phenomena are forecast or observed.

RESISTENCIA RADIO

4675	H24	H+20	A*	RESISTENCIA, CORRIENTES, POSADAS, CATARATAS DEL IGUAZU, AEROPARQUE JORGE NEWBERY, ROSARIO, SAUCE VIEJO, ASUNCION (Paraguay).
		H+20	F	PRESIDENCIA ROQUE SANEZ PENA, FORMOSA, RECONQUISTA, MONTE CASEROS, PASO DE LOS LIBRES, CURUZU CUATIA, GOYA.
		H+50	ST	RESISTENCIA FIR*, EZEIZA FIR**, CORDOBA FIR***. *Every Hour. **Every Even Hour. ***Every Odd Hour.

NOTE: Broadcast of any information depends upon availability.

ROMA CIAMPINO

126.0	H24	Continuous	S	ROMA ACC.
			A	ROMA CIAMPINO.
			AT	ROMA/FIUMICINO, CAPODICHINO, CATANIA/FONTANAROSSA, PALERMO, LINATE, MALPENSA, MALTA, TUNIS.

ROYAL AIR FORCE

5450	H24	Continuous	A
11253	H24	Continuous	A

Broadcast of airfields will be twice an hour in slot times allotted below:

00/30	BENSON, COLTISHALL, CONINGSBY, LEEMING, LECHARS, LOOSIEMOUTH, MARHAM, ODIHAM, SHAWBURY, HANNOVER, GEILENKIRCHEN, GARDERMOEN, TRONDHEIM
06/36	ALDERGROVE, BIRMINGHAM, BRIZE, NORTON, CRANWELL, EAST MIDLANDS, KINOLOSS, LYNEHAM, MANCHESTER, NORTHOLT, PRESTWICK, ST MAWGAN, STANSTED, WADDINGTON

C-42 METEOROLOGICAL INFORMATION

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>	<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
	12/42		SPLIT, BUDAPEST, BARI, GIOIA DEL COLLE, AVIANO, RIMINI, ANCONA, ROME, CONSTANTA, BUCHAREST, PRISTINA, SKOPJE
	18/48		KEFLAVIK, ASCENSION, BANJUL, DAKAR, GIBRALTAR, MOMBASA, NAIROBI, RIO DE JANEIRO, MONTEVIDEO, BRIZE, NORTON, LYNEHAM, WADDINGTON, FUJAIRAH
	24/54		ADANA, AKROTIRI, AL UDEID, AMMAN, BASRAH, SAUDI, CARIO, KEBUL, KUWAIT, MUSCAT, AL KHARJ, SALALAH, THUMRAIT

SALTA RADIO

5475	H24	H+15	A*	CORDOBA, JUJUY, SALTA, TUCUMAN, RESISTENCIA, CATARATAS DEL IGUAZU, AEROPARQUE JORGE NEWBERY, ANTOFAGASTA (Chile), SANTA CRUZ DE LA SIERRA (Bolivia).
		H+15	F*	ORAN, LA RIOJA, CATAMARCA, CERES, RIO CUARTO, MARCOS JUAREZ, TARTAGAL, VILLA DOLORES, CHILECITO.
		H+45	ST	CORDOBA FIR*, RESISTENCIA FIR**, MENDOZA FIR***. *Every Hour. **Every Even Hour. ***Every Odd Hour. NOTE: Broadcast of any information depends upon availability.

SANTIAGO

126.6	H24	Continuous	A	MADRID, BARCELONA, ASTURIAS, SANTIAGO, LISBOA, PORTO, FARO, BREST, NANTES.
-------	-----	------------	---	--

SCOTTISH

125.725	H24	Continuous	AT	ABERDEEN, ALDERGROVE, EDINBURGH, GLASGOW, HEATHROW, INVERNESS, PRESTWICK, STORNOWAY, SUMBURGH.
---------	-----	------------	----	--

SEVILLA

127.0	H24	Continuous	AT	BARAJAS, SEVILLA, MALAGA, GIBRALTAR, LISBOA, FARO, CASABLANCA, TANGER, RABAT/SALE.
-------	-----	------------	----	--

METEOROLOGICAL INFORMATION C-43

FACILITY/FREQUENCY		TIME	TYPE	AIRPORTS SERVICED
SHANNON				
3413	SS-SR	H+00	FS	BRUSSELS NTL, HAMBURG.
8957	H24		AS	BRUSSELS NTL, HAMBURG, FRANKFURT MAIN, COLOGNE/BONN, DUSSELDORF, MUNICH.
5505	H24			
13264	SR-SS			
		H+05	F	HEATHROW, SHANNON, PRESTWICK.
			A	HEATHROW, SHANNON, PRESTWICK, GATWICK, SCHIPHOL, MANCHESTER.
		H+10	AS	KASTRUP, ARLANDA, LANDVETTER, BERGEN/FLESLAND, OSLO/ GARDERMOEN, HELSINKI/VANTAA, DUBLIN, BARCELONA.
		H+15	F	BARAJAS, LISBON, ORLY.
			A	BARAJAS, LISBON, SANTA MARIA, ORLY, CHARLES DE GAULLE, SATOLAS.
		H+20	FS	ROME/FIUMICINO, MALPENSA.
			AS	ROME/FIUMICINO, MALPENSA, ZURICH, GENEVA/COINTRIN, TURIN/CASELLE, KEFLAVIK.
		H+30	FS	FRANKFURT MAIN, COLOGNE/BONN.
			AS	BRUSSELS NTL, HAMBURG, FRANKFURT MAIN, COLOGNE/BONN, DUSSELDORF, MUNICH.
		H+35	F	GATWICK, SCHIPHOL, MANCHESTER.
			A	HEATHROW, SHANNON, PRESTWICK, GATWICK, SCHIPHOL, MANCHESTER.
		H+40	AS	KASTRUP, ARLANDA, LANDVETTER, BERGEN/FLESLAND, OSLO/ GARDERMOEN, HELSINKI/VANTAA, DUBLIN, BARCELONA.
		H+45	F	SANTA MARIA, ATHENS, CHARLES DE GAULLE.
		H+45	A	BARAJAS, LISBON, SANTA MARIA, ORLY, CHARLES DE GAULLE, SAINT EXUPERY.
		H+50	FS	ZURICH, GENEVA/COINTRIN.
			AS	ROME/FIUMICINO, MALPENSA, ZURICH, GENEVA/COINTRIN, TURIN/CASELLE, KEFLAVIK.
SINGAPORE				
6676	1230-2230Z	H+20 & H+50	A	SINGAPORE, KUALA LUMPUR, SULTAN ABDUL AZIZ SHAH, SOEKARNO-HATTA, KUCHING, BRUNEI, KOTA KINABALU, BALI, PENANG.
11387	2230-1230Z		F	SINGAPORE
			F*	KUALA LUMPUR
			F**	SOEKARNO-HATTA
			S	SINGAPORE
				* H+20 only
				** H+50 only
SOFIA				
126.6	H24	Continuous	T	SOFIA, VARNNA, BURGAS, PLOVDIV, BUDAPEST, BUCURESTI, BEOGRAD, THESSALONKI, ISTANBUL

C-44 METEOROLOGICAL INFORMATION

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>		<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
STOCKHOLM				
127.6	H24	Continuous	AFT	ARLANDA, SKAVSTA, KASTRUP, LANDVETTER*, OSLO, HELSINKI, TURKU.
			AF	KUNGSANGEN, STURUP, VISBY.
				*Available 0500-1800Z++.
				NOTE: Information updated H+05 & H+35
SUNDSVALL*				
127.8	H24	Continuous	AFT	ARLANDA.
			AF	BROMMA, SUNDSVALL-HARNOSAND, UMEA, FROSON, ORNSKOLDSVIK, SKELLETEA, LULEA, KIRUNA.
			A	KRAMFORS.
				*The transmission is controlled from ARLANDA.
				NOTE: Information updated H-05 & H-35.
SYDNEY				
6676	H24	H+00 & H+30	T	SYDNEY/KINGSFORD SMITH, BRISBANE, MELBOURNE, ADELAIDE, DARWIN, TOWNSVILLE, PERTH, CAIRNS.
11387	H24		F	CAIRNS.
TAIWAN				
2880	H24	H+07	AF	CHIAYI, HUALIEN, MAKUNG, TAICHUNG, TAINAN.
5010			AFT	CHIANG KAI SHEK INTL, FENGNNIN.
12400				
TEGUCIGALPA				
4710	1200-2400Z	H+50	AT	AUGUSTO CESAR SANDINO, LA AURORA, SANTA MARIA, TONCONTIN.
TRENTON (MILITARY)				
15034	1000-0000Z	H+20-40	AT	GANDER, HALIFAX, SHEARWATER, GREENWOOD, BAGOTVILLE, TRENTON, OTTAWA, TORONTO/L B Pearson INT.
6754	2300-1100Z			WINNIPEG, EDMONTON, COLD LAKE, COMOX, VICTORIA*, ABBOTSFORD*.
*AT- IF TIME PERMITS.				
TEL-AVIV				
126.8	H24	Continuous	AS	ATHINAI, BEN GURION, EILAT, JERUSALEM, LARNACA, OVDA.
TOKYO				
2863	H24	H+10-15 & H+40-45	AFT	NEW TOKYO INTL (NARITA), KANSAI INTL.
6679			A	TOKYO INTL (HANEDA), NEW CHITOSE, NAGOYA, FUKUOKA, SEOUL/KOREA.
8828				
13282				

METEOROLOGICAL INFORMATION C-45

<u>FACILITY/FREQUENCY</u>	<u>TIME</u>		<u>TYPE</u>	<u>AIRPORTS SERVICED</u>
TUNIS				
126.6	0600-1800Z	Continuous	AF	EL MAOU, NEFTA, CARTHAGE, ZARZIS, MONASTIR/HABIB BOURGUIBA INTL.
WARSZAWA				
127.6	H24	Continuous	AT	WARSAW, POZNAN, GDANSK, MOSCOW/Sheremetyevo, BUDAPEST, PRAGUE, BERLIN/Schonefeld, COPENHAGEN, STOCKHOLM/Arlanda.
WIEN				
126.00	H24	Continuous	AFST	SCHWECHAT, BRATISLAVA, BUDAPEST, ZAGREB, MUNCHEN.
	0250-2250Z++		AFST	LINZ,* SALZBURG*, GRAZ*, KLAGENFURT*.
122.55	0500-1800Z++	Continuous	AFST	During operational hours. WR. NEUSTADT, WR. NEUSTADT/OST, VOSLAU SEMMERING/STUJLECK, NEUTENGBACH, TULLN, ST. POLTEN, KREMS, ALLENTSTEIG, HAAG, FREISTADT/FLUGPLATZ, MARIAZELL, PYHRNPAL SCHOBERSTEIN, SCHOBERPAL, UBELBACH, KAPFENBERG, GUSSING.
122.55	0500-1800Z++	Continuous	AS	WIENER NEUSTADT, VOSLAU, NEULENGBACH, TULIN, ST. POLTEN, KREMS, ALLENSTEIG, HAAG, MARIAZELL, PYHRNPAL, SCHOBERPAL, UBELBACH, KAPFENBERG, MONICKIRCHEN, GUSSING.
YOKOTA				
18002	0001-0800Z	H+00 & H+30	A	ELMENDORF, KADENA, OSAN, YOKOTA.
13201	2100-1000Z			
11236	H24			
8967	H24			
6738	0800-2400Z			
4747	1000-2100Z			
ZAGREB				
127.8	0500-2100Z	H+10-H+15	AT	ZAGREB, LJUBLJANA, BEOGRAD, DUBROVNIK, SPLIT, RIJEKA, ZURICH, MUNCHEN, FRANKFURT MAIN, SARAJEVO.
ZURICH				
127.2	H24	Continuous	A	ZURICH, GENEVA, BALE-MULHOUSE, FRANKFURT/MAIN, MUNCHEN, STUTTGART, MALPENSA, LINATE, LUGANO.

C-46 METEOROLOGICAL INFORMATION

7. NATIONAL WEATHER SERVICE - FAA WEATHER INFORMATION SERVICE

(AIM)

a. The National Weather Service (NWS) maintains an extensive surface, upper air, and radar observation program and also supports the FAA pilot weather briefing services.

b. Aviation weather forecasts are prepared by Weather Service Forecast Offices. Types of forecasts prepared are:

(1) Terminal Forecasts (FT) - prepared 3 times a day (CONUS and Caribbean) or 4 times a day (Alaska and Hawaii). FT are valid for 24 hours with the last 6 hours in categorical outlooks.

(a) Categorical outlooks describing ceiling and visibility are defined as follows:

1. LIFR (Low IFR) - Ceiling less than 500 feet and/or visibility less than 1 mile.

2. IFR - Ceiling 500 to less than 1,000 feet and/or visibility 1 to less than 3 miles.

3. MVFR (Marginal VFR) - Ceiling 1,000 to 3,000 feet and/or visibility 3 to 5 miles inclusive.

4. VFR - Ceiling greater than 3,000 feet and visibility greater than 5 miles including sky clear.

5. The cause of LIFR, IFR, or MVFR is indicated by either ceiling or visibility restrictions or both. The contraction "CIG" and/or weather and obstruction to vision symbols are used. If wind or gusts of 25 knots or greater are forecast for the outlook period, the word "WIND" is also included for all categories including VFR.

(2) Route Forecasts - prepared 3 times a day, with the morning and mid- day forecasts valid for 12 hours and the evening forecast valid for 18 hours.

(3) Area Forecasts (FA) - prepared 3 times a day (CONUS) and 4 times a day (Hawaii) and amended as required.

(4) Winds aloft forecasts - provided for CONUS, Alaska, and Hawaii.

c. Inflight weather advisories are issued only when required.

d. FAA Weather Services:

(1) Preflight weather briefings are obtained from FSS or NWS briefer and are available 24 hours a day in person, by radio, or by phone. FSS briefers are not authorized to make original forecasts, but translate and interpret available weather data for your route and destination. NWS briefers do not provide aeronautical information or accept flight plans. There are three types of preflight briefings. You should specify the type you desire along with route, destination, ETD, ETA, and type of flight, IFR or VFR.

(a) Standard briefing - request this briefing if you have not received recorded preliminary information such as TWEB.

(b) Abbreviated briefing - request this briefing if you have received recorded preliminary information, need to update a previous briefing, or need only one or two specific items.

(c) Outlook briefing - request this briefing when your ETD is 6 or more hours from the briefing time. This is for planning purposes only and a Standard or Abbreviated briefing is needed prior to departure.

METEOROLOGICAL INFORMATION C-47

(2) Available weather reports and forecasts are displayed at each FSS and Weather Service Office. Pilots should feel free to use this information or ask a specialist for assistance.

8. FAA PILOT-TO-WEATHER BRIEFER SERVICE

(AIM)

a. Direct pilot-to-weather briefer service is available by radio contact with any Flight Service Station operated by the FAA. Flight Service Specialists are qualified and certified by the NWS as Pilot Weather Briefers. They are not authorized to make original forecasts, but are authorized to translate and interpret the available forecasts and reports directly into terms of weather conditions which you can expect along your flight route and at destination. They will also assist you in selecting an alternate course of action in the event adverse weather is encountered. Combined Station/Tower (CS/T) personnel are not certified pilot weather briefers. They can assist by providing factual data from weather reports and forecasts.

9. FAA WEATHER BROADCASTS

(AIM)

a. TRANSCRIBED WEATHER BROADCASTS (TWEB)

(1) Meteorological and aeronautical data are recorded on tapes and broadcast continuously over selected low frequency (190-535 KHz) navigational aids and/or VORs.

(2) Generally, the broadcast contains route-oriented data with prepared National Weather Service (NWS) forecasts, inflight advisories, winds aloft, and select current information such as weather reports, NOTAMs, or special notices. At selected locations, telephone access to the TWEB has been provided (TEL- TWEB). Telephone numbers for this service are available from the FSS. TWEB services are made available for preflight and inflight planning and should not be considered a substitute for preflight weather briefings.

b. Hazardous Inflight Weather Advisory Service (HIWAS)

(1) A continuous broadcast of inflight weather advisories on VOR frequencies including summarized Severe Weather Forecast Alert (AWW), SIGMETs, Convective SIGMETs, Center Weather Advisories (CWA), AIRMETs, and PIREPs. HIWAS makes additional weather information available but is not a replacement for preflight or inflight briefings or real time weather updates from EFAS.

(2) Where HIWAS has been implemented, a HIWAS alert will be broadcast on all but emergency frequencies by ARTCC and terminal facilities and will include an alert announcement, frequency instruction, and type of advisory updated.

(3) Where HIWAS has been implemented, a HIWAS alert will be broadcast on all but emergency frequencies by FSSs and will include an alert announcement, frequency instruction, and type of advisory updated.

(4) In those areas where HIWAS has been implemented, ARTCC, Terminal, and FSS facilities have discontinued broadcast of inflight weather advisories listed in paragraph SIGMETs and AIRMETs, subparagraphs (6) and (8).

c. UNSCHEDULED BROADCASTS - These broadcasts are made by FSSs on VOR and select VHF frequencies upon receipt of special weather reports, PIREPs, NOTAMs, and other information enhancing safety of flight. These broadcasts will begin with the announcement "Aviation Broadcast" followed by data identification.

d. Select Alaskan Flight Service Stations having voice facilities on VORs or NDBs, broadcast weather reports and Notice to Airmen information at 15 minutes past each hour from reporting points within approximately 150 miles from the broadcast station.

C-48 METEOROLOGICAL INFORMATION

10. ENROUTE FLIGHT ADVISORY SERVICE (EFAS)

(AIM 7-1-4)

a. EFAS is a service specifically designed to provide enroute aircraft with timely and meaningful weather advisories pertinent to the type of flight intended, route of flight, and altitude. In conjunction with this service, EFAS is also a central collection and distribution point for pilot reported weather information. EFAS is provided by specially trained specialists in selected AFSS's controlling multiple Remote Communications Outlets covering a large geographical area and is normally available throughout the conterminous U.S. and Puerto Rico from 6 a.m. to 10 p.m. EFAS provides communications capabilities for aircraft flying at 5,000 feet above ground level to 17,500 feet MSL on a common frequency of 122.0 MHz. Discrete EFAS frequencies have been established to ensure communications coverage from 18,000 through 45,000 MSL serving in each specific ARTCC area. These discrete frequencies may be used below 18,000 feet when coverage permits reliable communication.

NOTE: When an EFAS outlet is located in a time zone different from the zone in which the flight watch control station is located, the availability of service may be plus or minus one hour from the normal operating hours.

b. Contact flight watch by using the name of the ARTCC facility identification serving the area of your location, followed by your aircraft identification, and the name of the nearest VOR to your position. The specialist needs to know this approximate location to select the most appropriate transmitter/receiver outlet for communications coverage.

EXAMPLE-

Cleveland Flight Watch, Cessna One Two Three Four Kilo, Mansfield V-O-R, over.

c. Charts depicting the location of the flight watch control stations (parent facility) and the outlets they use are contained in the A/FD. If you do not know in which flight watch area you are flying, initiate contact by using the words "Flight Watch," your aircraft identification, and the name of the nearest VOR. The facility will respond using the name of the flight watch facility.

EXAMPLE-

Flight Watch, Cessna One Two Three Four Kilo, Mansfield V-O-R, over.

d. AFSS's that provide Enroute Flight Advisory Service are listed regionally in the A/FD's.

e. EFAS is not intended to be used for filing or closing flight plans, position reporting, getting complete preflight briefings, or obtaining random weather reports and forecasts. Enroute flight advisories are tailored to the phase of flight that begins after climb-out and ends with descent to land. Immediate destination weather and terminal aerodrome forecasts will be provided on request. Pilots requesting information not within the scope of flight watch will be advised of the appropriate AFSS/FSS frequency to obtain the information. Pilot participation is essential to the success of EFAS by providing a continuous exchange of information on weather, winds, turbulence, flight visibility, icing, etc., between pilots and flight watch specialists. Pilots are encouraged to report good weather as well as bad, and to confirm expected conditions as well as unexpected to EFAS facilities.

11. INFLIGHT WEATHER ADVISORIES

(AIM 7-1-5)

a. The NWS issues inflight weather advisories designated as Severe Weather Forecasts Alerts (AWW's), Convective SIGMET's (WST's), SIGMET's (WS's), Center Weather Advisories (CWA's), and AIRMET's (WA's). Inflight advisories serve to notify enroute pilots of the possibility of encountering hazardous flying conditions which may not have been forecast at the time of the preflight briefing. Whether or not the condition described is potentially hazardous to a particular flight is for the pilot and/or aircraft dispatcher in a 14 CFR Part 121 operation to evaluate on the basis of experience and the operational limits of the aircraft. Inflight weather advisories in the contiguous U.S. are described and plotted primarily using high altitude VOR's as reference points. In Alaska and Hawaii, advisories are described and plotted using either geographic references or latitude/longitude coordinates.

METEOROLOGICAL INFORMATION C-49

b. Severe Weather Forecast Alerts (AWW's) are preliminary messages issued in order to alert users that a Severe Weather Bulletin (WW) is being issued. These messages define areas of possible severe thunderstorms or tornado activity. The messages are unscheduled and issued as required by the Aviation Weather Center at Kansas City, Missouri.

- (1) Each AWW is numbered sequentially beginning January 1 of each year.

EXAMPLE-

MKC AWW 161755

WW 279 SEVERE TSTM NY PA NJ

161830Z-170000Z

AXIS..70 STATUTE MILES EITHER SIDE OF LINE..10W KMSS TO 20E KABE..AVIATION

COORDS..60 NM EITHER SIDE / 60 NW KSLK - 35W KEWR..HAIL SURFACE AND ALOFT..2

INCHES. SURFACE WIND GUSTS..65 KNOTS. MAX TOPS TO 540. MEAN WIND VECTOR 19020.

REPLACES WW 278..OH PA NJ

(2) Status reports are issued as needed on Severe Weather Watch Bulletins to show progress of storms and to delineate areas no longer under the threat of severe storm activity. Cancellation bulletins are issued when it becomes evident that no severe weather will develop or that storms have subsided and are no longer severe.

c. Convective SIGMETS's (WST's) in Conterminous U.S.: WST's concern only thunderstorms and related phenomena (tornadoes, heavy precipitation, hail, and high surface winds) over the conterminous U.S. and imply the associated occurrence of turbulence, icing, and convective low level wind shear. Individual WST's for each day are numbered sequentially (00-1-99), beginning at 00Z. The affected geographic area is contained in the number; i.e., the first WST issued each day in the eastern U.S. is Convective SIGMET 1E, the second is Convective SIGMET 2E, and so forth. WST's are issued on a scheduled basis, hourly at 55 minutes past the hour (H+55), and are valid for two hours or until superseded by the next hourly update. WST's are issued for any of the following phenomena:

- (1) Severe thunderstorm due to:

- (a) Surface winds greater than or equal to 50 knots.
- (b) Hail at the surface greater than or equal to 3/4 inches in diameter.
- (c) Tornadoes.

- (2) Embedded thunderstorms.

- (3) A line of thunderstorms.

(4) Thunderstorms greater than or equal to VIP level 4 affecting 40% or more of an area at least 3,000 square miles.

REFERENCE-

Pilot/Controller Glossary Term-Radar Weather Echo Intensity Levels.

NOTE: Since thunderstorms are the reason for issuing the WST, severe or greater turbulence, severe icing, and low-level wind shear (gust fronts, downbursts, microbursts, etc.) are implied and will not be specified in the advisory.

- d. Convective SIGMET Bulletins.

(1) Three Convective SIGMET bulletins, each covering a specified geographic area, are issued. These areas are the Eastern (E), Central (C), and Western (W) U.S.. The boundaries that separate the Eastern from the Central and the Central from the Western U.S. are 87 and 107 degrees West, respectively. These bulletins are issued on a scheduled basis, hourly at 55 minutes past the hour (H+55), and as a special bulletins on an unscheduled basis.

C-50 METEOROLOGICAL INFORMATION

(2) Each of the Convective SIGMET bulletins will be:

- (a) Made up of one or more individually numbered Convective SIGMET's.
- (b) Valid for two hours or until superseded by the next hourly issuance.
- (c) The text of the bulletin consists of either an observation and a forecast or just

a forecast.

(3) On an hourly basis, an outlook is made for each of the three Convective SIGMET regions. The outlook for a particular region is appended to the Convective SIGMET bulletin for the same region. The convective outlook is also appended to special Convective SIGMET's. The outlook is reviewed each hour and revised when necessary. The outlook is a forecast and meteorological discussion for thunderstorm systems that are expected to require Convective SIGMET issuances during a time period 2-6 hours into the future. Furthermore, an outlook will always be made for each of the three regions, even if it is a negative statement.

e. SIGMET's (WS's) within the conterminous U.S. are issued by the Aviation Weather Center (AWC) when the following phenomena occur or are expected to occur:

- (1) Severe or extreme turbulence or clear air turbulence (CAT) not associated with thunderstorms.
- (2) Severe icing not associated with thunderstorms.
- (3) Duststorms, sandstorms, or volcanic ash lowering surface or inflight visibilities to below three miles.
- (4) Volcanic eruption.

f. Volcanic eruption SIGMET's are identified by an alphanumeric designator which consists of an alphabetic identifier and issuance number. The first time an advisory is issued for a phenomenon associated with a particular weather system, it will be given the next alphabetic designator in the series and will be numbered as the first for that designator. Subsequent advisories will retain the same alphabetic designator until the phenomenon ends. In the conterminous U.S., this means that a phenomenon that is assigned an alphabetic designator in one area will retain that designator as it moves within the area or into one or more other areas. Issuances for the same phenomenon will be sequentially numbered, using the same alphabetic designator until the phenomenon no longer exists. Alphabetic designators NOVEMBER through YANKEE, except SIERRA and TANGO are only used for SIGMET's, while designators SIERRA, TANGO and ZULU are used for AIRMET's.

g. Center Weather Advisories(CWA's)

(1) CWA's are unscheduled inflight, flow control, air traffic, and air crew advisory. By nature of its short lead time, the CWA is not a flight planning product. It is generally a Nowcast for conditions beginning within the next two hours. CWA's will be issued:

(a) As a supplement to an existing SIGMET, Convective SIGMET or AIRMET.

(b) When an Inflight Advisory has not been issued but observed or expected weather conditions meet SIGMET/AIRMET criteria based on current pilot reports and reinforced by other sources of information about existing meteorological conditions.

(c) When observed or developing weather conditions do not meet SIGMET, Convective SIGMET, or AIRMET criteria; e.g., in terms of intensity or area coverage, but current pilot reports or other weather information sources indicate that existing or anticipated meteorological phenomena will adversely affect the safe flow of air traffic within the ARTCC area of responsibility.

METEOROLOGICAL INFORMATION C-51

(2) The following example is a CWA issued from the Kansas City, Missouri, ARTCC. The "3" after ZKC in the first line denotes this CWA has been issued for the third weather phenomena to occur for the day. The "301" in the second line denotes the phenomena number again (3) and the issuance number (1) for this phenomena. The CWA was issued at 2140Z and is valid until 2340Z.

EXAMPLE-

ZKC3 CWA 032140

ZKC CWA 301 VALID UNTIL 032340

ISOLD SVR TSTM over KCOU MOVG SWWD 10KTS ETC.

h. AIRMET's (WA) may be of significance to any pilot or aircraft operator and are issued for all domestic airspace. They are of particular concern to operators and pilots of aircraft sensitive to the phenomena described and to pilots without instrument ratings and are issued by the AWC for the following weather phenomena which are potentially hazardous to aircraft:

- (1) Moderate icing.
- (2) Moderate turbulence.
- (3) Sustained winds of 30 knots or more at the surface.
- (4) Widespread area of ceilings less than 1,000 feet and/or visibility less than three miles.
- (5) Extensive mountain obscurement.

i. AIRMET's are issued on a scheduled basis every six hours, with unscheduled amendments issued as required. AIRMET's have fixed alphanumeric designator with ZULU for icing and freezing level data, TANGO for turbulence, strong surface winds, and wind shear, and SIERRA for instrument flight rules and mountain obscuration.

12. AUTOMATED WEATHER OBSERVATION SYSTEM (AWOS)

(AIM)

a. AWOS is a real time system consisting of various sensors, a processor, a computer generated voice subsystem, and transmitter to broadcast local minute- by-minute weather directly to the aircraft.

(1) AWOS observations derived from an automated system will include the prefix "AWOS."

(2) Some AWOS locations will be augmented by certified observers who will provide weather and obstruction to visibility information in the remarks of the report when the reported visibility is less than 3 miles. Augmentation is identified as "OBSERVER WEATHER."

(3) The reported visibility is derived from a sensor near the touchdown of the primary instrument runway. The AWOS visibility is reported as a runway visibility value and may differ from the prevailing visibility.

(4) The reported sky condition/ceiling is derived from the ceilometer located next to the visibility sensor and may differ from the Observer sky condition because the AWOS is totally dependent on clouds over the sensor site.

b. There are four operational levels of AWOS:

AWOS-A - reports only altimeter setting.

AWOS-1 - reports altimeter setting, wind data, temperature, dew point, and density

C-52 METEOROLOGICAL INFORMATION

altitude.

AWOS-2 - reports information in AWOS-1 plus visibility.

AWOS-3 - reports information in AWOS-2 plus cloud and ceiling data.

NOTE: AWOS information is transmitted over a discrete radio frequency or the voice portion of a local NAVAI. The system transmits a 20 to 30 second weather message each minute. The messages are updated each minute and are receivable within 25 NM of the AWOS site, at or above 3000' AGL.

c. AWOS broadcasts phraseology generally follows that used in other weather broadcasts. Following are explanations of exceptions.

(1) The word "TEST" is added when the system is not in commissioned status.

(2) The phrase "TEMPORARILY INOPERATIVE" is added when the system is inoperative.

(3) Ceiling is announced as either "CEILING" or "INDEFINITE CEILING." All automated ceiling heights are measured ceilings except indefinite ceilings.

(4) The word "CLEAR" is not used in AWOS due to limitations in height ranges of the sensors. No clouds detected is announced as "NO CLOUDS BELOW" or "CLEAR BELOW."

(5) "SKY CONDITION MISSING" is announced only if the system level is able to report ceiling/sky condition and the data is not available. Ceiling/sky conditions are not announced if the system level is not able to report them.

(6) "VISIBILITY LESS THAN ONE QUARTER" is the lowest visibility reported. "VISIBILITY MISSING" is announced only if the system level is able to report visibility and the data is not available. Visibility is not announced if the system level is not able to report it.

(7) If remarks are included, the word "REMARKS" is announced after the altimeter setting in the following priority:

(a) Automated remarks

- Density altitude
- Variable visibility
- Variable wind direction

(b) Manual remarks (prefaced with "OBSERVER WEATHER")

- Type and intensity of precipitation
- Direction and intensity of thunderstorms
- Obstructions to visibility when 3 miles or less

13. AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS)

(AIM)

a. The ASOS is the primary surface weather observing system of the United States. The program to install and operate up to 1,700 systems throughout the United States is a joint effort of the National Weather Service (NWS), the FAA and the Department of Defense. ASOS is designed to support aviation operations and weather forecast activities. The ASOS will provide continuous minute-by-minute observations and perform the basic observing functions necessary to generate an aviation routine weather report (METAR) and other aviation weather information. The

METEOROLOGICAL INFORMATION C-53

information may be transmitted over a discrete VHF radio frequency or the voice portion of a local NAVAI. ASOS transmissions on a discrete VHF radio frequency are engineered to be receivable to a maximum of 25 NM from the ASOS site and a maximum altitude of 10,000 feet AGL. At many locations, ASOS signals may be received on the surface of the airport, but local conditions may limit the maximum reception distance and/or altitude. While the automated system and the human may differ in their methods of data collection and interpretation, both produce an observation quite similar in form and content. For the "objective" elements such as pressure, ambient temperature, dew point temperature, wind, and precipitation accumulation, both the automated system and the observer use a fixed location and time-averaging technique. The quantitative differences between the observer and the automated observation of these elements are negligible. For the "subjective" elements, however, observers use a fixed time, spatial averaging technique to describe the visual elements (sky condition, visibility and present weather), while the automated systems use a fixed location, time averaging technique. Although this is a fundamental change, the manual and automated techniques yield remarkably similar results within the limits of their respective capabilities.

(1) System Description:

(a) The ASOS at each airport location consists of four main components:

1. Individual weather sensors.
2. Data collection package(s) (DCP).
3. The acquisition control unit.
4. Peripherals and displays.

(b) The ASOS sensors perform the basic function of data acquisition. They continuously sample and measure the ambient environment, derive raw sensor data and make them available to the collocated DCP.

(2) Every ASOS will contain the following basic set of sensors:

- (a) Cloud height indicator (one or possibly three).
- (b) Visibility sensor (one or possibly three).
- (c) Precipitation identification sensor.
- (d) Freezing rain sensor (at select sites).
- (e) Pressure sensors (two sensors at small airports; three sensors at large airports).
- (f) Ambient temperature/Dew point temperature sensor.
- (g) Anemometer (wind direction and speed sensor).
- (h) Rainfall accumulation sensor.

(3) The ASOS data outlets include:

- (a) Those necessary for on-site airport users.
- (b) National communications networks.
- (c) Computer-generated voice (available through FAA radio broadcast to pilots, and dial-in telephone line).

(4) An ASOS/AWOS report without human intervention will contain only that weather data capable of being reported automatically. The modifier for this METAR report is "AUTO". When an observer augments or backs-up an ASOS/AWOS site, the "AUTO" modifier disappears.

C-54 METEOROLOGICAL INFORMATION

(5) There are two types of automated stations, AO1 for automated weather reporting stations without a precipitation discriminator, and AO2 for automated stations with a precipitation discriminator. As appropriate, "AO1" and "AO2" shall appear in remarks. (A precipitation discriminator can determine the difference between liquid and frozen/freezing precipitation).

14. METAR and TAF Code

a. **Aviation Routine Weather Reports (METAR)** is the observation code used to report meteorological data. METAR was adopted internationally for worldwide use, but each country can modify the code (i.e. use meters vice miles). When METAR data is missing, it is simply omitted. Some exceptions apply in remarks such as RVRNO or SLPNO when RVR or SLP are normally reported but are not currently available.

- **Report Type: METAR** is a scheduled observation taken between 55-59 minutes past the hour (a.k.a. hourly observation). **SPECI** (Special Report) is an unscheduled observation taken when a predefined condition criteria change occurs.

METAR KBLV 011657Z AUTO/COR 25015G30KT 210V290 3/8SM R32L/1000FT FG BKN005 01/M01 A2984 RMK SLP034

SPECI KBLV 011715Z 25015G30KT 210V290 3SM BKN015 01/M01 A2984 RMK SLP034

Where: KBLV, Scott AFB (International Civil Aviation Organization (ICAO)).
When: **011657Z**, first two digits (01) are the date; the last four (1657) are time (UTC).

Designators/Correction Modifiers: **AUTO** is an observation taken from an unattended Automated Surface Observation System (ASOS). **AO1** is an ASOS without a rain vice snow discriminator and **AO2** has a discriminator. **COR** is an observation corrected for an error.

Wind: **25015G30KT**, 250 degrees at 15 knots (KTS) gusting (G) to 30 knots

Wind Variability: **210V290**, reported when direction varies by at least 60 degrees and speeds are greater than 6 knots, with direction extremes (**210** and **290**) separated by "V." **VRB** is used (without direction extremes) when speed is less than or equal to 6 knots.

Visibility: **3/8SM (statute miles)**, is the prevailing visibility. Sector visibility is reported in Remarks, if it differs from the prevailing and is less than 3 miles. Overseas locations use meters vice statute miles with 9999 (7 sm or greater) as the largest value.

Runway Visual Range (RVR): **R32L/1000FT**, used when prevailing visibility is one sm or less and/or the RVR for the runway is 6000 ft/1830 meters or less. Runway **32L** (32-Left(**C**-Center, **R**-Right)) has **1000ft** (meters overseas) visibility. **M** is RVR less than lowest reportable sensor value and **P** is greater than highest value **V** means RVR is variable. **R06L200V4000FT** means RVR for **6** Left is Variable between **2,000** and **4,000ft**.

Significant Weather: **FG**, is fog. See weather Table to decode.
Sky Condition: **BKN005**, is broken (**BKN**) ceiling at 500 feet (**005**) AGL. Clouds are reported in eights for coverage and hundreds of feet AGL for heights. Automated systems do not report cloud bases above 12,000 feet. **NOTE:** an asterisk (*) denote ceiling:

SKC 0 (Sky clear, NOTE: ASOS will use CLR for no clouds below 12,000 ft)

FEW Trace-2

SCT 3-4

***BKN** 5-7

***OVC** 8

TCU Towering Cumulus present

CB Cumulonimbus/thunderstorm present

***VV** Vertical Visibility (indefinite ceiling)

METEOROLOGICAL INFORMATION C-55

Temperature/Dew Point: 01/M01, Temperature (01) and dewpoint (M01) in degrees Celsius. An "M" is minus or below zero.

Altimeter: A2984, A is the altimeter designator and 2984 is 29.84 inches of mercury (U.S.). International locations may use hectopascals or millibars.

Remarks: RMK SLP034, Remarks (RMK) may be encoded in plain language and will contain supplementary data. **SLP034** is sea level pressure (SLP) at 1003.4 millibars (**034**). Place a "10" (if the 3 digit value is 400 or less) or "9" before the group and a decimal before the last digit.

Caution: Do not confuse METAR RMK 5xxxx (3 hr pressure tendency) or 6xxxx (6-hr precipitation amounts) with the TAF 5xxxx (turbulence) and 6xxxx (icing).

Weather Table:

Step 1: Intensity (preceeding group)	Step 3: Description	Step 4: Precipitation	Step 5: Obscuration	Step 6: Other
Light (-)	MI Shallow	DZ Drizzle	FG Fog (vsby<= 5/8 mile)	PO dust/sand whirls
Moderate No sign	PR Partial (covering only part of sky)	RA Rain	BR Mist (vsby>= 5/8 mile)	SQ Squalls
Heavy (+)		SN Snow	FU Smoke	FC Funnel cloud (S) ex. Tornado or Waterspout
+can also mean " a well developed dust/sand storm, whirl, dust devil tornado or waterspout	BC Patches	SG Snow Grains	VA Volcanic Ash	SS Sandstorm
	DR Low Drifting	IC Ice Crystals	DU Dust	DS Dust Storm
	BL Blowing	PL Ice Pellets	SA Sand	
	SH Showers	GR Hail (>5 mm or .2)	HZ Haze	
Step 2: Proximity	TS Thunderstorm	GS Small hail (<5 mm or .2")	PY Spray	
VC In the Vicinity	FZ Freezing	UP Unknown Precipitation (ASOS only)		
Examples:				
TSRA - thunderstorm, moderate rain	-RA FG - light rain, fog	BLPY - blowing spray	VCSH - showers in the vicinity	FZDZ - freezing drizzle
+SN - heavy snow	BR HZ - mist, haze (vis>=5/8 mi.)	BCFG - patchy fog	+DRSN - heavy snow, drifting	BCFG - patchy fog

REMARKS TABLE:

REMARK:	Decode as:
WSHFT45	Wind SHiFT at 45 minutes past the hour
FROPA	FRONtal PAssage

C-56 METEOROLOGICAL INFORMATION

PKWND 34050/38	Peak Wind 340 at 50 knots occurred at 38 minutes past the hour
RVRNO	RVR NOt reported
RABO5E30SNB20E55	Rain Began at 05 min past hour-Ended at 30 min past hour
	SNow Began at 20 min. past the hour Ended at 55 min. past hour
TSB05E30	ThunderStorm Began at 05 min. past hour and Ended at 30 min past hour
PRESRR/PRESFR	PRESsure Rising Rapidly/PRESsure Falling Rapidly
RSC	Runway Surface Condition
RCR01	Runway Condition Reading valued 0 to 25 - highest values are optimum
LSR	Light Snow on Runway
PSR	Packed Snow on Runway
IR	Ice on Runway
RCRNR	RCR NOT Reported or base operations closed
OCNL	OCcasioNaL (less than 1 flash/minute)
FRQ	FRreQuent (about 1 to 6 flashes/minute)
CONS	COntiNuouS (more than 6 flashes/minute)
CG	Cloud to Ground
IC	In Cloud
CC	Cloud to Cloud
CB W MOV E	CumulonimBus West Moving East
CBMAM DSNT S	CumulonimBus MAMatus DiStaNT South
TCU OVD	Towering CUmulus OVerhead
ACC W	AltoCumulus Casatellanus West
ACSL SW-S	AltoCumulus Standing Lenticular SouthWest through south
CCSL OVR MT E	CirroCumulus Standing Lenticular OVeR the MounTain(s) East
VIRGA DSNT NE	Virga (Precipitation observed but not reaching ground) distant northeast
TWR VIS 1	ToWer VISibility 1 mile (reported if greater than surface)
SFC VIS 2 1/2	SurFaCe VISibility 2-1/2 miles
VIS 2 RY 11	VISibility 2 miles at Runway one-one
VIS 1V2	VISibility Variable between 1 and 2 miles
VIS N2	VISibility to the North 2 miles
WR	Wet Runway

Statute Miles to Meters					
STATUTE MILES	METERS	STATUTE MILES	METERS	STATUTE MILES	METERS
0	0000	1-1/2	2400	3	4800
1/16	0100	-	2500	-	4900
1/8	0200	1-5/8	2600	-	5000
3/16	0300	-	2700	4	6000
1/4	0400	1-3/4	2800	-	7000
5/16	0500	-	2900	5	8000

METEOROLOGICAL INFORMATION C-57

Statute Miles to Meters					
STATUTE MILES	METERS	STATUTE MILES	METERS	STATUTE MILES	METERS
3/8	0600	1-7/8	3000	6	9000
-	0700	-	3100	7	9999
1/2	0800	2	3200	8	9999
-	0900	-	3300	9	9999
5/8	1000	-	3400	10	9999
-	1100	-	3500	11	9999
3/4	1200	2-1/4	3600	12	9999
-	1300	-	3700	13	9999
7/8	1400	-	3800	14	9999
-	1500	-	3900	15	9999
1	1600	2-1/2	4000	20	9999
-	1700	-	4100	25	9999
1-1/8	1800	-	4200		
-	1900	-	4300		
1-1/4	2000	2-3/4	4400		
-	2100	-	4500		
1-3/8	2200	-	4600		
-	2300	-	4700		

b. **Aerodrome Forecast (TAF).** The **TAF** is a forecast for a particular terminal covering a period of time up to 24 hours. A **TAF** contains a forecast of wind, prevailing visibility, precipitation and/or obstruction to visibility, sky coverage (eights), icing, turbulence, minimum altimeter setting and pertinent plain language remarks. If required an amended TAF (**AMD**) is issued and supersedes the previous TAF because it no longer represents the current or expected weather. Also corrected TAF (**COR**) is a TAF corrected for error and supersedes previous TAF's. Refer to the time in the last text line for the current forecast.

CIVIL TAF:

TAF

KSTL 051130Z 051212 14008KT 5SM BR BKN030 WS010/18025KT

TEMPO 1316 1 1/2 SM BR FM 1600 16010KT P6SM NSW SKC BECMG 2224
20013G20KT 4SM SHRA OVC020 PROB40 0006 2SM TSRA OVC008CB BECMG
0608 21015KT P6SM NSW SCT040

MILITARY TAF:

TAF

KBLV051212 14005KT 8000 BR FEW030 QNH2960INS WS010/18040KT
BECMG 1314 16010KT 3200 -SHRA OVC020 QNH2959INS
TEMPO 1416 VRB15G30KT 1600 TSRA BKN008CB OVC020
BECMG 1617 29008KT 3200 -RA OVC030 620304 QNH2958INS
BECMG 1819 31012G22KT 9999 NSW SCT040 520004 QNH2952INS

C-58 METEOROLOGICAL INFORMATION

BECMG 2021 30008KT 9999 SKC QNH2950INS TM01/11Z 08/18Z

- Where:** KBLV, Scott AFB and KSTL St. Louis (ICAOs)
- Date and Valid Times:** 051130Z 051212, is the date (05) and the issuance time (1130Z) (omitted in military TAFs). Forecast is valid for 05 at 12Z until the next day (06) at 12Z.
- Change Groups:** TEMPO 1316, FM 1600, BECMG 2224, and PROB40 0006, TEMPO 1316 is a temporary condition between 13Z and 16Z. FM 1600 is "From 16Z" indicating a rapid change in conditions. BECMG 2224 is "becoming 22Z to 24Z" indicating a gradual change in conditions by the end time listed. PROB40 0006 (civil use only) is "40% probability of associated weather conditions occurring between 00Z and 06Z."
- Wind:** 20013G20KT, 200 degrees (true) at 13 knots (KT) gusting (G) to 20 knots. Variable (VRB) winds can't be forecasted with confidence due to: thunderstorms, are less than 6 knots, or vary by more than 60 degrees (has a variance (V) range (i.e. 210V300)).
- Visibility:** 5SM, P6SM, 8000, 9999, is 5 statute miles (SM). P6SM means plus (P) six statute miles (6SM) or unrestricted (U.S. civil). 8000 meters (military/overseas) and 9999 is visibility greater than 9000 meters (7 sm or greater). CAVOK (Ceiling And Visibility OK) is no significant weather, visibility is 10 km or greater and no ceilings below 5,000 ft.
- Forecast Weather:** SHRA is light rain showers. See Weather Table to decode. NSW (no significant weather) is used when the weather listed in the previous group is no longer expected to occur. NSW does NOT indicate the absence of clouds or hazards. Absence of any weather group indicates that no weather is expected during the forecast period.
- Sky Condition:** BKN030 is a broken (BKN) ceiling at 3000 feet (030) AGL. Clouds are forecasted in eights for coverage and hundreds of feet AGL for heights. NOTE: an asterisk (*) denotes a ceiling:

- SKC Sky clear
- FEW Trace-2
- SCT 3-4
- *BKN 5-7
- *OVC 8
- CB Cumulonimbus/thunderstorm
- *VV Vertical Visibility (indefinite ceiling)

Icing Conditions: 620304, is icing (6) light in cloud (RIME) (2) from 3,000 ft (030) to 7,000 ft (4). The icing group is for surface up to 10,000 ft, non-thunderstorm associated, and is prefixed with a 6. To decode:

1. The icing designator "6" (620304).
2. Next digit is type and intensity (620304) (see table)
3. Next three digits is the base in hundreds off feet (620304).
4. Last digit is the thickness in thousands of feet (620304), add to base to get layer top.

	Icing intensity
Code	Decode
0	Trace or none
1	Light icing (mixed)
2	Light icing in cloud (RIME)
3	Light icing in precipitation (clear)
4	Moderate icing (mixed)
5	Moderate icing in cloud (RIME)
6	Moderate icing in precipitation (clear)
7	Sever icing (mixed)

METEOROLOGICAL INFORMATION C-59

	Icing intensity
8	Severe icing in cloud (RIME)
9	Severe icing in precipitation (clear)

Turbulence Conditions: 520004, turbulence (5) is occasional turbulence in clear air (2) from surface (000) to 4,000 feet (4). The turbulence group is for surface up to 10,000 ft, non-thunderstorm associated, CAT II aircraft, and is prefixed with a 5. To decode:

1. The turbulence designator is "5" (520004).
2. Next digit is the intensity (520004) (see table).
3. Next three digits is the base in hundreds of feet (520004).
4. Last digit is the thickness in thousands of feet (520004), add to base to get layer top.

	Turbulence Intensity
Code	Decode
0	Trace
1	Light turbulence
2	Moderate turbulence in clear air occasional
3	Moderate turbulence in clear air frequent
4	Moderate turbulence in cloud occasional
5	Moderate turbulence in cloud frequent
6	Severe turbulence in clear air occasional
7	Severe turbulence in clear air frequent
8	Severe turbulence in cloud occasional
9	Severe turbulence in cloud frequent
X	Extreme turbulence

Lowest Altimeter Setting: QNH2960INS (military and international), is the minimum altimeter (QNH) setting of 29.60 inches of mercury (INS). Some countries are hectopascals or millibars (Q1016).

Wind Shear: WS010/18040KT, is wind shear (WS) at 1,000 ft (010) AGL, 180 degrees true direction at 40 knots (040KT). WS is included when non-convective low level winds (up to 2,000 ft AGL) change in speed and/or direction creating shear. **WSCONDS** is potential wind shear when not enough data is available to reliably predict exact parameters.

Temperatures: TM01/11Z 08/18Z (first or last line military TAF's), are temperatures (T) for TAF time period (051212Z). Minimum is -1°C (M01) and will occur at 11Z. Maximum is 8°C (08) and will occur at 18Z.

15. AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS)

(AIM)

a. ATIS frequencies are incorporated on individual FLIP Terminal Instrument Approach Procedures, Enroute Charts and aerodrome listings in the Enroute Supplement. Where this service is available, listing will be found on the COMMUNICATIONS line, e.g., (ATIS 108.5). Pilots will be expected to listen to ATIS broadcasts where in operation to obtain essential, but routine, terminal information. The following procedures apply:

(1) ATIS broadcasts are recorded and the pilot should notify controllers that he has received the broadcast by repeating the alphabetical code word appended to the broadcast. Example: "INFORMATION ECHO RECEIVED".

(2) When the pilot acknowledges that he has received the ATIS broadcast, controllers may omit those items contained on the broadcast if they are current. Rapidly changing conditions will be issued by Air Traffic Control and the ATIS will contain words as follows: "LATEST"

C-60 METEOROLOGICAL INFORMATION

CEILING/VISIBILITY/ALTIMETER/(OTHER CONDITIONS) WILL BE ISSUED BY APPROACH CONTROL/TOWER."

(3) The absence of a sky condition/ceiling and/or visibility on ATIS indicates a sky condition/ceiling of 5000 feet or above and visibility of 5 miles or more. A remark may be made on the broadcast, "The weather is better than 5000 and 5," or the existing weather may be broadcast.

(4) Controllers will automatically issue pertinent information to pilots who do not acknowledge receipt of the ATIS broadcast or who acknowledge receipt of a broadcast which is not current.

16. PILOT WEATHER REPORTS (PIREPs) FORMAT

(AFFSA/AFFSA LTR)

a. Pilots will immediately report hazardous weather conditions, thunderstorms/lightning, turbulence, icing and windshear to ARTCC, terminal ATC, or FSS. Also, pilots are urged to promptly volunteer reports of cloud bases, tops and layers, flight visibility, precipitation, strong winds, and any other significant flight condition information. Follow with a report to METRO to ensure rapid dissemination to other using agencies. If flight conditions delay reporting to METRO while airborne, ensure the PIREP is reported to METRO immediately after landing.

b. The following procedures are applicable when making inflight weather reports:

(1) PILOT REPORTS WILL BE MADE UNDER THE FOLLOWING CONDITIONS:

- (a) Inflight when requested.
- (b) When unusual and unforecast weather conditions are encountered.
- (c) When weather conditions on an IFR approach differ from the latest observation.
- (d) When a missed approach is executed due to weather.
- (e) When a wind shear is encountered on departure or arrival. (See following report

format)

(2) PIREP FORMAT:

- (a) Location of phenomena (station identifier, radial/DME and route segment)
- (b) Time (UTC)
- (c) Altitude (MSL)
- (d) Type Aircraft
- (e) Skycover (bases, tops and amount)
- (f) Flight Visibility and Weather
- (g) Air Temperature
- (h) Wind
- (i) Turbulence (see tables below)
- (j) Icing (see tables below)
- (k) Remarks

METEOROLOGICAL INFORMATION C-61

(3) TURBULENCE REPORTING TABLES - REPORT THE TURBULENCE INTENSITY AND FREQUENCY -

<u>INTENSITY</u>	<u>AIRCRAFT REACTION</u>	<u>REACTION INSIDE ACFT</u>
LIGHT	LIGHT TURBULENCE: Turbulence that momentarily causes slight, erratic changes in altitude and/or attitude.	Occupants may feel a slight strain against seat belts or shoulder straps. Unsecured objects may be displaced slightly. Food service may be conducted and little or no difficulty is encountered in walking.
MODERATE	MODERATE TURBULENCE: Turbulence that causes changes in altitude and/or attitude, but with the aircraft remaining in positive control at all times. It usually causes variations in indicated airspeed. or MODERATE CHOP: Turbulence that causes rapid bumps or jolts without appreciable changes in aircraft altitude or attitude.	Occupants feel definite strains against seat belts or shoulder straps. Unsecured objects are dislodged. Food service and walking are difficult.
SEVERE	SEVERE TURBULENCE: Turbulence that causes large, abrupt changes in altitude and/or attitude. It usually causes large variations in indicated airspeed. Aircraft may be momentarily out of control.	Occupants are forced violently against seat belts or shoulder straps. Unsecured objects are tossed about. Food service and walking are impossible.
EXTREME	EXTREME TURBULENCE: Turbulence in which the aircraft is violently tossed about and is practically impossible to control. It may cause structural damage.	

<u>FREQUENCY</u>	<u>DEFINITION</u>
OCCASIONAL INTERMITTENT	Less than 1/3 of the time 1/3 to 2/3 of the time
CONTINUOUS	More than 2/3 of the time
CLEAR AIR TURBULENCE (CAT)	
High level turbulence (normally above 15,000 feet MSL) not associated with cumuliform clouds should be reported as CAT, preceded by the appropriate intensity. The success of the CAT Forecast Program depends heavily on CAT PIREPs.	

(4) AIRFRAME ICING REPORTING TABLES - REPORT ICING INTENSITY AND TYPE

C-62 METEOROLOGICAL INFORMATION

INTENSITY	ICE ACCUMULATION
TRACE	Ice becomes perceptible. Rate of accumulation slightly greater than rate of sublimation. It is not hazardous even though de-icing/anti-icing equipment is not used, unless encountered for an extended period of time (over one hour).
LIGHT	The rate of accumulation may create a problem if flight is prolonged in this environment (over one hour). Occasional use of de-icing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the de-icing/anti-icing equipment is used.
MODERATE	The rate of accumulation is such that even short encounters become potentially hazardous and use of de-icing/anti-icing equipment or diversion is necessary.
SEVERE	The rate of accumulation is such that de-icing/anti-icing equipment fails to reduce or control the hazard. Immediate diversion is necessary.
TYPE	DEFINITION
RIME ICE	Rough, milky, opaque ice formed by the instantaneous freezing of small super cooled water droplets.
CLEAR ICE	Glossy, clear or translucent ice formed by the relatively slow freezing of large super cooled water droplets.

(5) WIND SHEAR REPORTS - Pilots should, as soon as possible, report the following to the controlling agency with a follow-up call to Metro when time permits.

(a) If able state the loss/gain of airspeed and the altitude(s) at which it was encountered.

EXAMPLE: "Lewandowski Approach Control (call sign) encountered wind shear on final, gained 25 knots between 600 and 400 feet followed by loss of 40 knots between 400 feet and surface."

(b) If unable to report shear in specific terms, make reports in terms of the effect upon their aircraft.

EXAMPLE: "Even Tower (call sign) encountered an abrupt wind shear at 800 feet on final, max thrust required."

17. WORLD METEOROLOGICAL ORGANIZATION GROUND/AIR CODE

Civil Meteorological Messages transmitted to aircraft may utilize this Code in reporting the amount of individual Cloud Layer or Mass. The term "OKTA" is used, in this instance, preceded by a number 1 through 8. The relationship of this Code System to the more common use of tenths is shown in the following table:

0	0
1 OKTA or less, but not zero	1/10 or less, but not zero
2 OKTAS	2/10 - 3/10
3 OKTAS	4/10
4 OKTAS	5/10
5 OKTAS	6/10
6 OKTAS	7/10 - 8/10
7 OKTAS or more but no 8 OKTAS	9/10 or more but not 10/10

METEOROLOGICAL INFORMATION C-63

8	OKTAS	10/10
9	Sky obscured, or cloud amount cannot be estimated.	

18. NATO COLOR CODED WEATHER CONDITIONS

(RAF FIH)

<u>COLOR</u>	<u>BASE OF LOWEST CLOUD LAYER OF 3/8 (SCT) OR MORE</u>	<u>SURFACE VISIBILITY</u>
BLUE	2500 ft AGL	8 km (4.3 nm)
WHITE	1500 ft AGL	5 km (2.7 nm)
GREEN	700 ft AGL	3.7 km (2 nm)
YELLOW*	300 ft AGL	1.6 km (0.9 nm)
AMBER	200 ft AGL	0.8 km (0.4 nm)
RED	Below 200 ft AGL	Less than 0.8 km (0.4 nm)
BLACK	BLACK Airfield not usable for other reasons than cloud and/or visibility minima.	

BLACK, when used, will precede weather color code.

*NOTE:

At RAF airfields under the control of HQ 1-3 and at RN airfields code yellow is sub-divided as follows:

YELLOW 1	500 ft AGL	2.5 KM (1.4 nm)
YELLOW 2	300 ft AGL	1.6 KM (0.9 nm)

**INTENTIONALLY
LEFT
BLANK**

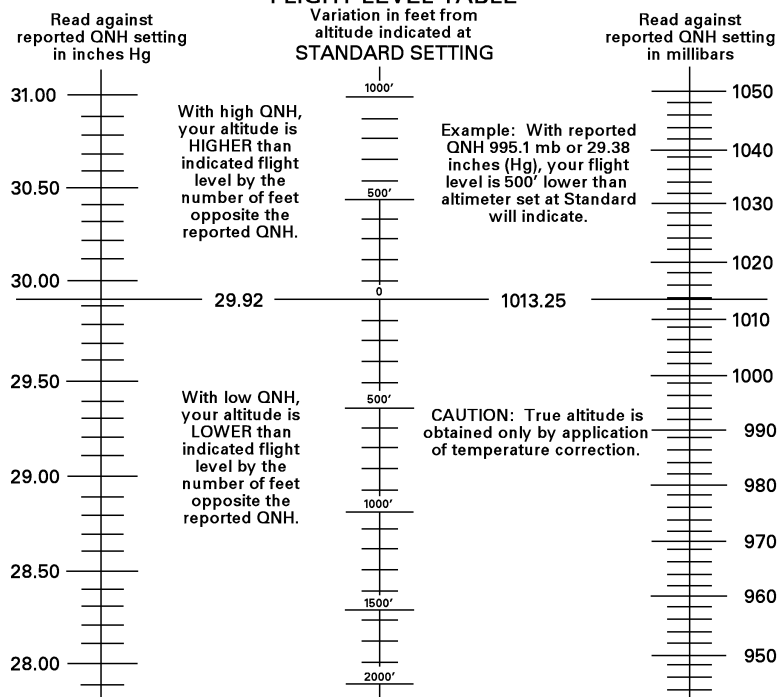
SECTION D**CONVERSION TABLES**
&
FREQUENCY PAIRING**TABLE OF CONTENTS**

	<u>PAGE NO.</u>
Aircraft Classification Numbers - DoD Aircraft	D-12
Frequency Pairing Plan	D-15
Tables (Conversion)	D-2
Altimeter Setting	D-2
Altitude Pressure Table - Inches Feet	D-3
Flight Level	D-2
Gallons/Pounds	D-10
Inches/Millibars	D-4
Kilograms/Pounds	D-11
Kilometers/SM/NM	D-7
Liters/Kilograms	D-11
Liters/U.S. Gallons/Imperial Gallons	D-10
Meters/Feet	D-7
Meters/NM	D-8
Meters/Yards	D-8
Meters to Feet	D-9
Meters per Second to Nautical Miles per Hours (Knots)	D-9
Millimeters to Hectopascals or Millibars	D-6
Millimeters to Inches	D-5
PSI/DYNE	D-12
Temperature Scales in Degrees	D-2
Temperature Error	D-14

D-2 CONVERSION TABLES

1. TABLES (CONVERSION)

FLIGHT LEVEL TABLE



ALTIMETER SETTING		
SETTING	AT AIRPORT	IN THE AIR
Standard 29.92 Hg - 1013.25 mb	Variable elevation reading above or below actual elevation	Positive separation by pressure level but at varying actual altitudes
QNH	Actual elevation reading when aircraft on ground	Altitude indicated (without consideration of temperature)

TEMPERATURE SCALES IN DEGREES

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
-40	-40.0	-28	-18.4	-16	3.2	-4	24.8	8	46.4	20	68.0	32	89.6	44	111.2
-39	-38.2	-27	-16.6	-15	5.0	-3	26.6	9	48.2	21	69.8	33	91.4	45	113.0
-38	-36.4	-26	-14.8	-14	6.8	-2	28.4	10	50.0	22	71.6	34	93.2	46	114.8
-37	-34.6	-25	-13.0	-13	8.6	-1	30.2	11	51.8	23	73.4	35	95.0	47	116.6
-36	-32.8	-24	-11.2	-12	10.4	0	32.0	12	53.6	24	75.2	36	96.8	48	118.4
-35	-31.0	-23	-9.4	-11	12.2	1	33.8	13	55.4	25	77.0	37	98.6	49	120.2
-34	-29.2	-22	-7.6	-10	14.0	2	35.6	14	57.2	26	78.8	38	100.4	50	122.0
-33	-27.4	-21	-5.8	-9	15.8	3	37.4	15	59.0	27	80.6	39	102.2		
-32	-25.6	-20	-4.0	-8	17.6	4	39.2	16	60.8	28	83.4	40	104.0		
-31	-23.8	-19	-2.2	-7	19.4	5	41.0	17	62.6	29	84.2	41	105.8		
-30	-22.0	-18	-0.4	-6	21.2	6	42.8	18	64.4	30	86.0	42	107.6		
-29	-20.2	-17	1.4	-5	23.0	7	44.6	19	66.2	31	87.8	43	109.4		

ALTITUDE PRESSURE TABLE - INCHES FEET												
Inches	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09		
28.0	1824	1814	1805	1795	1785	1776	1766	1756	1746	1737		
28.1	1727	1717	1707	1698	1688	1678	1668	1659	1649	1639		
28.2	1630	1620	1610	1601	1591	1581	1572	1562	1552	1542		
28.3	1533	1523	1513	1504	1494	1484	1475	1465	1456	1446		
28.4	1436	1427	1417	1407	1398	1388	1378	1369	1359	1350		
28.5	1340	1330	1321	1311	1302	1292	1282	1273	1263	1254		
28.6	1244	1234	1225	1215	1206	1196	1186	1177	1167	1158		
28.7	1148	1139	1129	1120	1110	1100	1091	1081	1072	1062		
28.8	1053	1043	1034	1024	1015	1005	995	986	976	967		
28.9	957	948	938	929	919	910	900	891	881	872		
29.0	863	853	844	834	825	815	806	796	787	777		
29.1	768	758	749	739	730	721	711	702	692	683		
29.2	673	664	655	645	636	626	617	607	598	589		
29.3	579	570	560	551	542	532	523	514	504	495		
29.4	485	476	467	457	448	439	429	420	410	401		
29.5	392	382	373	364	354	345	336	326	318	308		
29.6	298	289	280	270	261	252	242	233	224	215		
29.7	205	196	187	177	168	159	149	140	131	122		
29.8	112	103	94	85	75	66	57	47	38	29		
29.9	20	10	+1	-8	-17	-26	-36	-45	-54	-63		
30.0	-73	-82	-91	-100	-110	-119	-128	-137	-146	-156		
30.1	-165	-174	-183	-192	-202	-211	-220	-229	-238	-248		
30.2	-257	-266	-275	-284	-293	-303	-312	-321	-330	-339		
30.3	-348	-358	-367	-376	-385	-394	-403	-412	-421	-431		
30.4	-440	-449	-458	-467	-476	-485	-494	-504	-513	-522		
30.5	-531	-540	-549	-558	-567	-576	-585	-594	-604	-613		
30.6	-622	-631	-640	-649	-658	-667	-676	-685	-694	-703		
30.7	-712	-721	-730	-740	-749	-758	-767	-776	-785	-794		
30.8	-803	-812	-821	-830	-839	-848	-857	-866	-875	-884		
30.9	-893	-902	-911	-920	-929	-938	-947	-956	-965	-974		
31.0	-983	-992	-1001	-1010	-1019	-1028	-1037	-1046	-1055	-1064		

D-4 CONVERSION TABLES

BAROMETRIC READINGS FROM INCHES TO HECTOPASCALS OR MILLIBARS										
Inches	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
	Hectopascals or Millibars									
28.0-	948.2	948.5	948.9	949.2	949.5	949.9	950.2	950.6	950.9	951.2
28.1-	951.6	951.9	952.3	952.6	952.9	953.3	953.6	953.9	954.3	954.6
28.2-	955.0	955.3	955.6	956.0	956.3	956.7	957.0	957.3	957.7	958.0
28.3-	958.3	958.7	959.0	959.4	959.7	960.0	960.4	960.7	961.1	961.4
28.4-	961.7	962.1	962.4	962.7	963.1	963.4	963.8	964.1	964.4	964.8
28.5-	965.1	965.5	965.8	966.1	966.5	966.8	967.2	967.5	967.8	968.2
28.6-	968.5	968.8	969.2	969.5	969.9	970.2	970.5	970.9	971.2	971.6
28.7-	971.9	972.2	972.6	972.9	973.2	973.6	973.9	974.3	974.6	974.9
28.8-	975.3	975.6	976.0	976.3	976.6	977.0	977.3	977.6	978.0	978.3
28.9-	978.7	979.0	979.3	979.7	980.0	980.4	980.7	981.0	981.4	981.7
29.0-	982.1	982.4	982.7	983.1	983.4	983.7	984.1	984.4	984.8	985.1
29.1-	985.4	985.8	986.1	986.5	986.8	987.1	987.5	987.8	988.1	988.5
29.2-	988.8	989.2	989.5	989.8	990.2	990.5	990.9	991.2	991.5	991.9
29.3-	992.2	992.5	992.9	993.2	993.6	993.9	994.2	994.6	994.9	995.3
29.4-	995.6	995.9	996.3	996.6	997.0	997.3	997.6	998.0	998.3	998.6
29.5-	999.0	999.3	999.7	1000.0	1000.3	1000.7	1001.0	1001.4	1001.7	1002.0
29.6-	1002.4	1002.7	1003.0	1003.4	1003.7	1004.1	1004.4	1004.7	1005.1	1005.4
29.7-	1005.8	1006.1	1006.4	1006.8	1007.1	1007.4	1007.8	1008.1	1005.5	1008.8
29.8-	1009.1	109.5	109.8	1010.2	1010.5	1010.8	1011.2	1011.5	1011.9	1012.2
29.9-	1012.5	1012.9	1013.2	1013.5	1013.9	1014.2	114.6	1014.9	1015.2	1015.6
30.0-	1015.9	1016.3	1016.6	1016.9	1017.3	1017.6	1017.9	1018.3	1018.6	1019.9
30.1-	1019.3	1019.6	1020.0	1020.3	1020.7	1021.0	1021.3	1021.7	1022.0	1022.3
30.2-	1022.7	1023.0	1023.4	1023.7	1024.0	1024.4	1024.7	1025.1	1025.4	1025.7
30.3-	1026.1	1026.4	1026.8	1027.1	1027.4	1027.8	1028.1	1028.4	1028.8	1029.1
30.4-	1029.5	1029.8	1030.1	1030.5	1030.8	1031.2	1031.5	1031.8	1032.2	1032.5
30.5-	1032.18	1033.2	1033.5	1033.9	1034.2	1034.5	1034.9	1035.2	1035.6	1035.9
30.6-	1036.2	1036.6	1036.9	1037.2	1037.6	1037.9	1038.3	1038.6	1038.9	1039.3
30.7-	1039.6	1040.0	1040.3	1040.6	1041.0	1041.3	1041.7	1042.0	1042.3	1042.7
30.8-	1043.0	1043.3	1043.7	1044.0	1044.4	1044.7	1045.0	1045.4	1045.7	1046.1
30.9-	1046.4	1046.7	1047.1	1047.4	1047.7	1048.1	1048.4	1048.8	1049.1	1049.4

CONVERSION TABLES D-5

Hundredths of an inch										
Inches	0.000	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.003
Hectopascals or Millibars	0.0	0.1	0.1	1.0	0.2	0.2	0.2	0.2	0.3	0.3
	BARAOMETRIC READINGS FROM MILLIBARS OR HECTOPASCALS TO INCHES									
Hecto- pascals or Millibars	0	1	2	3	4	5	6	7	8	9
	Inches									
940	27.76	27.79	27.82	27.85	27.88	27.91	27.94	27.96	27.99	28.02
950	28.05	28.08	28.11	28.14	28.17	28.20	28.23	28.23	28.29	28.32
960	28.35	28.38	28.41	28.44	28.47	28.50	28.53	28.56	28.59	28.61
970	28.64	28.67	28.70	28.73	28.76	28.79	28.82	28.85	28.88	28.91
980	28.94	28.97	29.00	29.03	29.06	29.09	29.12	29.15	29.18	29.21
990	29.23	29.26	29.29	29.32	29.35	29.38	29.41	29.44	29.47	29.50
1000	29.53	29.56	29.59	29.62	29.65	29.68	29.71	29.74	29.77	29.80
1010	29.83	29.85	29.88	29.91	29.94	29.97	30.00	30.03	30.06	30.09
1020	30.12	30.15	30.18	30.21	30.24	30.27	30.30	30.33	30.36	30.39
1030	30.42	30.45	30.47	30.50	30.53	30.56	30.59	30.62	30.65	30.68
1040	30.71	30.74	30.77	30.80	30.83	30.86	30.89	30.92	30.95	30.98
1050	31.01	31.04	31.07	31.10	31.12	31.15	31.18	31.21	31.24	31.27

	BARAOMETRIC READINGS FROM MILLIMETERS TO INCHES									
Milli- meters	0	1	2	3	4	5	6	7	8	9
	Inches									
710	27.97	28.01	28.05	28.09	28.13	28.17	28.21	28.24	28.28	28.32
720	28.36	28.40	28.44	28.48	28.52	28.56	28.60	28.64	28.68	28.72
730	28.76	28.80	28.84	28.88	28.91	28.95	28.99	29.03	29.07	29.11
740	29.15	29.19	29.23	29.27	29.31	29.35	29.39	29.43	29.47	29.51
750	29.55	29.58	29.62	29.66	29.70	29.74	29.78	29.82	29.86	29.90
760	29.94	29.98	30.02	30.06	30.10	30.14	30.18	30.21	30.25	30.29
770	30.33	30.37	30.41	30.45	30.49	30.53	30.57	30.61	30.65	30.69
780	30.73	30.77	30.81	30.85	30.88	30.92	30.96	31.00	31.04	31.08

D-6 CONVERSION TABLES

	BARAOMETRIC READINGS FROM MILLIMETERS TO HECTOPASCALS OR MILLIBARS									
Milli- meters	0	1	2	3	4	5	6	7	8	9
	Hectopascals or Millibars									
530	706.6	707.9	709.3	710.6	711.9	713.3	714.6	715.9	717.3	718.6
540	719.9	721.3	722.6	723.9	725.3	726.6	727.9	729.3	730.6	731.9
550	733.3	734.6	735.9	737.3	738.6	739.9	741.3	742.6	743.9	745.3
560	746.6	747.9	749.3	750.6	751.9	753.3	754.6	755.9	757.3	758.6
570	759.9	761.3	762.6	763.9	765.3	766.6	767.9	769.3	770.6	771.9
580	773.3	774.6	775.9	777.3	778.6	779.9	781.3	782.6	783.9	785.3
590	786.6	787.9	789.3	790.6	791.9	793.3	794.6	795.9	797.3	798.6
600	799.9	801.3	802.6	803.9	805.3	806.6	807.9	809.3	810.6	811.9
610	813.3	814.6	815.9	817.3	818.6	819.9	821.3	822.6	823.9	825.3
620	826.6	827.9	829.3	830.6	831.9	833.3	834.6	835.9	837.3	838.6
630	839.9	841.3	842.6	843.9	845.2	846.6	847.9	849.3	850.6	851.9
640	853.3	854.6	855.9	857.3	858.6	859.9	861.3	862.6	863.9	865.3
650	866.6	867.9	869.3	870.6	871.9	873.3	874.6	875.9	877.3	878.6
660	879.9	881.3	882.6	883.9	885.3	886.6	887.9	889.3	890.6	891.9
670	893.3	894.6	895.9	897.3	898.6	899.9	901.3	902.6	903.9	905.3
680	906.6	907.9	909.3	910.6	911.9	913.3	914.6	915.9	917.3	918.6
690	919.9	921.3	922.6	923.9	925.3	926.6	927.9	929.3	930.6	931.9
700	933.3	934.6	935.9	937.3	938.6	939.9	941.3	942.6	943.9	945.3
710	946.6	947.9	949.3	950.6	951.9	953.3	954.6	955.9	957.3	958.6
720	959.9	961.3	962.6	963.9	965.3	966.6	967.9	969.3	970.6	971.9
730	973.3	974.6	975.9	977.3	978.6	979.9	981.3	982.6	983.9	985.3
740	986.6	987.9	989.3	990.6	991.9	993.3	994.6	995.9	997.3	998.6
750	999.9	1001.3	1002.6	1003.9	1005.3	1006.6	1007.9	1009.3	1010.6	1011.9
760	1013.3	1014.6	1015.9	1017.2	1018.6	1019.9	1021.2	1022.6	1023.9	1025.2
770	1026.6	1027.9	1029.2	1030.6	1031.9	1033.2	1034.6	1035.9	1037.2	1038.6
780	1039.9	1041.2	1042.6	1043.9	1045.2	1046.6	1047.9	1049.2	1050.6	1051.9
790	1053.2	1054.6	1055.9	1057.2	1058.6	1059.9	1061.2	1062.6	1063.9	1065.2
800	1066.6	1067.9	1069.2	1070.6	1071.9	1073.2	1074.6	1075.9	1077.2	1078.6

DISTANCES

METERS FEET			KILOMETERS TO			STATUTE MILES TO			NAUTICAL MILES TO		
MTR	FT - MTR	FT	SM	KM	NM	KM	SM	NM	KM	NM	SM
0.305	1	3.281	0.62	1	0.54	1.61	1	0.87	0.185	0.1	0.115
0.610	2	6.562	1.24	2	1.08	3.22	2	1.74	0.370	0.2	0.230
0.914	3	9.843	1.86	3	1.62	4.83	3	2.61	0.556	0.3	0.345
1.219	4	13.123	2.49	4	2.16	6.44	4	3.48	0.741	0.4	0.460
1.524	5	16.404	3.11	5	2.70	8.05	5	4.34	0.926	0.5	0.575
1.829	6	19.685	3.73	6	3.24	9.66	6	5.21	1.111	0.6	0.690
2.134	7	22.966	4.35	7	3.78	11.27	7	6.08	1.296	0.7	0.806
2.438	8	26.247	4.97	8	4.32	12.87	8	6.95	1.482	0.8	0.921
2.743	9	29.528	5.59	9	4.86	14.48	9	7.82	1.667	0.9	1.036
3.048	10	32.808	6.21	10	5.40	16.09	10	8.69	1.85	1	1.15
6.096	20	65.617	12.43	20	10.80	32.19	20	17.38	3.70	2	2.30
9.144	30	98.425	18.64	30	16.20	48.28	30	26.07	5.56	3	3.45
12.192	40	131.233	24.86	40	21.60	64.37	40	34.76	7.41	4	4.60
15.240	50	164.042	31.07	50	27.00	80.47	50	43.45	9.26	5	5.75
18.288	60	196.850	37.28	60	32.40	96.56	60	52.14	11.11	6	6.90
21.336	70	229.658	43.50	70	37.80	112.65	70	60.83	12.96	7	8.06
24.384	80	262.467	49.71	80	43.20	128.74	80	69.52	14.82	8	9.21
27.432	90	295.275	55.92	90	48.60	144.84	90	78.21	16.67	9	10.36
30.480	100	328.083	62.14	100	54.00	160.93	100	86.90	18.52	10	11.51
60.960	200	656.2	124.28	200	107.99	321.86	200	173.8	37.04	20	23.02
91.440	300	984.3	186.42	300	161.99	482.79	300	260.7	55.56	30	34.52
121.920	400	1312.3	248.56	400	215.98	643.72	400	347.6	74.08	40	46.03
152.400	500	1640.4	310.69	500	269.98	804.65	500	434.5	92.60	50	57.54
304.800	1000	3280.8	372.83	600	323.97	965.58	600	521.4	111.12	60	69.05
609.601	2000	6561.7	434.97	700	377.97	1126.5	700	608.3	129.64	70	80.55
914.402	3000	9842.5	497.11	800	431.97	1287.4	800	695.2	148.16	80	92.06
1219.202	4000	13123.2	559.25	900	485.96	1448.4	900	782.1	166.68	90	103.57
1524.003	5000	16404.2	621.39	1000	539.96	1609.3	1000	869.0			

D-8 CONVERSION TABLES

DISTANCES

MILLIMETERS TO INCHES		METERS TO YARDS		YARDS TO METERS		NAUTICAL MILES TO METERS		METERS TO NAUTICAL MILES	
10	2/5	100	109	100	91	0.1	185	100	0.054
20	4/5	200	219	200	183	0.2	370	500	0.270
30	1 1/5	300	328	300	274	1/4	463	1000	0.540
40	1 3/5	400	437	400	366	0.3	556	2000	1.080
50	2	500	547	500	457	0.4	741	3000	1.620
		600	656	600	549	1/2	926	4000	2.160
		700	766	700	640	0.6	1111	5000	2.700
60	2 2/5	800	875	800	732	0.7	1296	6000	3.240
70	2 4/5	900	984	900	823	3/4	1389	7000	3.780
80	3 1/10					0.8	1482	8000	4.320
90	3 1/2					0.9	1667	9000	4.860
100	3 9/10	1000	1094	1000	914			10,000	5.399
		1100	1203	1100	1006	1	1852		
		1200	1312	1200	1097	1 1/4	2315		
110	4 3/10	1300	1422	1300	1189	1 1/2	2778		
120	4 7/10	1400	1531	1400	1280	1 3/4	3241		
130	5 1/10	1500	1640	1500	1372				
140	5 1/2	1600	1750	1600	1463	2	3704		
150	5 9/10	1700	1859	1700	1554	2 1/4	4167		
160	6 3/10	1800	1969	1800	1646	2 1/2	4630		
170	6 7/10	1900	2078	1900	1737	2 3/4	5093		
180	7 1/10	2000	2187	2000	1829				
190	7 1/2	3000	3281	3000	2743	3	5556		
200	7 9/10	4000	4374	4000	3658	3 1/4	6019		
		5000	5468	5000	4572	3 1/2	6482		
		6000	6562	6000	5486	3 3/4	6945		
210	8 3/10	7000	7655	7000	6401				
220	8 7/10	8000	8749	8000	7315	4	7408		
230	9 1/10	9000	9842	9000	8230	5	9260		
240	9 2/5								
250	9 4/5								

DISTANCES

METERS TO FEET													METERS PER SECOND TO NAUTICAL MILES PER HOUR (KNOTS)	
→ Meters ↓	0	100	200	300	400	500	600	700	800	900			Meters per Second	Nautical Miles per Hour (Knots)
	Feet													
0	0	328	656	984	1312	1641	1969	2297	2625	2953			65	127
1000	3281	3609	3937	4265	4593	4922	5250	5578	5906	6234			70	137
2000	6562	6890	7218	7546	7874	8203	8531	8859	9187	9515			75	146
3000	9843	10171	10499	10827	11155	11484	11812	12140	12468	12796			80	156
4000	13124	13452	13780	14108	14436	14765	15093	15421	15749	16077			85	166
5000	16405	16733	17061	17389	17717	18046	18374	18702	19030	19358			90	175
6000	19686	20014	20342	20670	20998	21327	21655	21983	22311	22639			95	185
7000	22967	23295	23623	23951	24279	24608	24936	25264	25592	25920			100	195
8000	26248	26576	26904	27232	27560	27889	28217	28545	28873	29201			105	205
9000	29529	29857	30185	30513	30841	31170	31498	31826	32154	32482			110	214
10000	32810	33138	33466	33794	34122	34451	34779	35107	35435	35763			115	224
11000	36091	36419	36747	37075	37403	37732	38060	38388	38716	39044			120	234
12000	39372	39700	40028	40356	40684	41013	41341	41669	41997	42325			125	243
13000	42653	42981	43309	43637	43965	44294	44622	44950	45278	45606			130	253
14000	45934	46262	46590	46918	47246	47575	47903	48231	48559	48887			135	263
15000	49215	49543	49871	50199	50527	50856	51184	51512	51840	52168			140	273
16000	52496	52824	53152	53480	53808	54137	54465	54793	55121	55449			145	282
													150	292
													155	302

D-10 CONVERSION TABLES

LIQUIDS					
U.S. GALS.	LTRS	IMP. GALS	U.S. GALS	IMP/U.S. GALS	IMP. GALS
0.264	1	0.220	1.201	1	0.833
0.528	2	0.440	2.402	2	1.665
0.792	3	0.660	3.603	3	2.498
1.057	4	0.880	4.803	4	3.331
1.321	5	1.100	6.004	5	4.164
1.585	6	1.320	7.205	6	4.996
1.849	7	1.540	8.406	7	5.829
2.113	8	1.760	9.607	8	6.662
2.377	9	1.980	10.808	9	7.495
2.642	10	2.200	12.009	10	8.327
5.283	20	4.399	24.017	20	16.655
7.925	30	6.599	36.026	30	24.982
10.566	40	8.799	48.035	40	3.309
13.208	50	10.999	60.043	50	41.636
15.849	60	13.198	72.052	60	49.964
18.491	70	15.398	84.061	70	58.291
21.132	80	17.598	96.070	80	66.618
23.774	90	19.797	108.078	90	74.946
26.416	100	21.997	120.087	100	83.273
U.S. GALLONS*			LITERS*		
TO LBS. AVIATION FUEL		TO LBS. TURBINE FUEL	TO KGS. AVIATION FUEL		TO KGS. TURBINE FUEL
6	1	6.7	0.7	1	0.8
60	10	66.8	7.2	10	8.0
120	20	133.5	14.4	20	16.0
180	30	200.3	21.6	30	24.0
240	40	267.0	28.8	40	32.0
300	50	333.8	35.9	50	40.0
360	60	400.6	43.1	60	48.0
420	70	467.3	50.3	70	56.0
480	80	534.1	57.5	80	64.0
540	90	600.9	64.7	90	72.0
600	100	667.6	71.9	100	80.0
1200	200	1335.0	143.8	200	160.0
1800	300	2003.0	215.7	300	240.0
2400	400	2670.0	287.6	400	320.0
3000	500	3338.0	359.4	500	400.0
3600	600	4006.0	431.3	600	480.0
4200	700	4673.0	503.2	700	560.0
4800	800	5341.0	575.1	800	640.0
5400	900	6009.0	647.0	900	720.0
6000	1000	6676.0	718.9	1000	800.0
12000	2000	13352.0	1438.0	2000	1600.0
18000	3000	20028.0	2157.0	3000	2400.0
24000	4000	26705.0	2876.0	4000	3200.0
30000	5000	33382.0	3595.0	5000	4000.0
60000	10000	66763.0	7189.0	10000	8000.0
*NOTE: These figures are approximate only, as temperature or octane will change volume/weight ratio.					

CONVERSION TABLES D-11

WEIGHTS

KGS.	LBS./KGS.	LBS.
0.454	1	2.205
0.907	2	4.409
1.361	3	6.614
1.814	4	8.818
2.268	5	11.023
2.722	6	13.228
3.175	7	15.432
3.629	8	17.637
4.082	9	19.842
4.536	10	22.046
9.072	20	44.092
13.608	30	66.139
18.144	40	88.185
22.68	50	110.23
27.216	60	132.28
31.751	70	154.32
36.287	80	176.37
40.823	90	198.42
45.359	100	220.46

OIL

LITERS	to	KGS. OIL	U.S. GALS	to	LBS.OIL
1		0.9	1		7.5
2		1.8	2		15.0
3		2.7	3		22.5
4		3.6	4		30.0
5		4.5	5		37.5
6		5.4	6		45.0
7		6.3	7		52.5
8		7.2	8		60.0
9		8.1	9		67.5
10		9.0	10		75.0
20		18.0	20		150.0
30		27.0	30		225.0
40		36.0	40		300.0
50		45.0	50		375.0
60		54.0	60		450.0
70		63.0	70		525.0
80		72.0	80		600.0
90		81.0	90		675.0
100		90.0	100		750.0

D-12 CONVERSION TABLES

PSI/DYNE CONVERSION TABLE

PRESSURE READING FROM PSI TO NEWTON/M² AND DYNES/CM²
TO OBTAIN:

$$\text{NEWTON/M}^2 = \text{CF} \times 10^4 \text{ OR DYNES/CM}^2 = \text{CF} \times 10^5$$

PSI	CF	EXAMPLE
1	.6895	20 PSI = 13.79x10 ⁴ NT/M ²
5	3.4475	= 13.79x10 ⁵ DYNES/CM ²
10	6.895	OR
15	10.3425	25x10 ⁵ DYNES/CM ² = 36.25 PSI
20	13.79	OR
25	17.2375	37x10 ⁴ NT/M ² = 53.66 PSI
30	20.685	OR
35	24.1325	250 PSI = 172.375x10 ⁵ DYNES/CM ²
40	27.58	
45	31.0275	
50	34.475	
55	37.9225	
60	41.37	
65	44.8175	FORMULA
70	48.265	PSI x 6895 = NT/M ² x 10 = DYNES/CM ²
75	51.7125	
80	55.16	
85	58.6075	
90	62.055	
95	65.5025	
100	68.95	

CF = Conversion Factor

2. AIRCRAFT CLASSIFICATION NUMBERS - DoD AIRCRAFT

(AFFSA/AFFSA LTR)

The aircraft and Pavement Classification Number (ACN/PCN) System is fully explained in the Airport/Facility Directory Legend of each Enroute Supplement. The table below gives the ACN values for DoD aircraft at the aircraft empty weight and maximum takeoff weight. An ACN value for an intermediate weight can be calculated by interpolation between the limits.

AIRCRAFT CLASSIFICATION NUMBERS

AIRCRAFT TYPE	WEIGHT EMPTY MAX T/O (1000 LBS)	TIRE PRESSURE PSI	RIGID PAVEMENT SUBGRADES				FLEXIBLE PAVEMENT SUBGRADES			
			HIGH	MED	LOW	ULTRA LOW	HIGH	MED	LOW	VERY LOW
A-7	22 42	280	8 18	8 18	8 18	8 17	8 17	8 16	8 16	8 16

CONVERSION TABLES D-13

AIRCRAFT TYPE	WEIGHT EMPTY MAX T/O (1000 LBS)	TIRE PRESSURE PSI	RIGID PAVEMENT SUBGRADES				FLEXIBLE PAVEMENT SUBGRADES			
			HIGH	MED	LOW	ULTRA LOW	HIGH	MED	LOW	VERY LOW
A-10	25 50	185	8 21	8 21	8 21	9 21	8 20	9 20	9 20	10 20
B-1B	189 477	220	14 68	16 80	20 92	24 101	11 32	12 28	11 23	9 15
B-52	200 488	305	36 119	40 129	43 140	48 151	28 88	30 94	32 105	38 123
C-5	374 840	111	8 29	10 32	11 39	14 48	10 37	13 43	17 54	24 80
C-9	57 110	148	11 30	12 32	13 33	14 34	10 28	12 31	14 34	17 39
C-12	10 17	95	2 4	2 4	2 4	2 5	1 3	2 4	2 4	2 5
C-17	268 580	138	22 52	22 52	22 52	24 70	18 52	20 59	22 71	28 94
C-20A, B	42 70	175	12 22	13 23	13 23	13 24	10 19	11 21	12 22	13 23
C-20H	44 75	175	13 24	13 25	13 26	14 26	11 21	12 22	13 23	15 24
C-21	10 17	146	2 4	2 4	2 4	2 4	2 4	2 4	2 5	3 5
C-22 B727	88 170	165	21 46	22 48	23 51	25 53	19 41	20 43	21 49	25 54
C-23	22 25	79	6 7	7 8	7 8	7 8	5 6	7 8	8 9	8 9
VC-25 B747	342 836	205	16 46	17 55	20 66	24 76	18 52	19 58	21 71	27 92
C-32	138 255	190	15 31	17 37	20 43	23 49	15 32	17 36	19 44	25 57
C-37A	48 90	195	15 31	15 31	16 32	16 32	12 24	12 26	14 28	15 29
C-40A	171 100	204	47 25	49 26	52 28	54 29	41 22	43 23	48 24	53 28
C-130	72 175	116	8 34	9 37	11 41	12 43	6 30	8 34	11 37	14 43
AC-130	110 175	116	18 34	20 37	22 41	24 43	15 30	17 34	21 37	25 43
EC-130	105 175	116	17 36	19 39	21 42	23 45	13 28	16 33	20 37	23 44
HC-130 H, N, P	84 175	116	13 34	14 37	15 41	17 43	8 30	12 34	15 37	18 43
C-135	142 302	155	11 34	12 41	14 50	17 56	10 34	13 41	16 49	20 56
C-141	150 345	190	16 48	18 58	21 68	25 75	17 51	18 58	21 70	28 86
E-3	176 325	195	16 38	19 46	22 55	26 62	15 38	19 45	23 54	28 61
E-4	440 803	200	19 45	21 55	25 64	30 74	24 58	28 57	35 86	51 126

D-14 CONVERSION TABLES

AIRCRAFT TYPE	WEIGHT EMPTY MAX T/O (1000 LBS)	TIRE PRESSURE PSI	RIGID PAVEMENT SUBGRADES				FLEXIBLE PAVEMENT SUBGRADES			
			HIGH	MED	LOW	ULTRA LOW	HIGH	MED	LOW	VERY LOW
E-6	180 342	195	20 46	22 53	26 62	30 71	21 47	23 53	25 64	33 80
F-4	32 58	265	11 26	12 26	12 25	12 25	13 27	13 26	13 26	13 25
F-5	11 25	318	4 11	4 11	4 11	4 11	4 11	4 10	4 10	4 10
F-15A, B	42 54	290	17 24	17 24	17 23	17 23	18 24	17 23	17 22	17 22
F-15C, D	42 68	355	17 33	17 33	17 32	17 32	18 30	17 28	17 27	17 27
F-15E	35 81	320	15 41	14 41	14 40	14 40	14 35	14 35	14 35	14 35
F-16A, B	17 35	275	6 15	6 15	6 15	6 15	6 14	6 14	6 14	6 13
F-16C, D	17 38	285	6 16	6 16	6 16	6 16	6 15	6 15	6 14	6 14
F-111	51 100	180	16 45	17 45	17 45	17 44	19 48	21 47	22 47	23 47
FB-111	50 119	220	15 56	16 56	16 55	17 54	18 59	20 58	21 57	22 56
KC-10	240 590	190	12 48	13 57	15 68	18 79	14 58	17 64	21 75	27 102
KC-135R	117 323	155	7 37	8 45	9 54	11 61	7 37	8 45	11 54	15 61
P-3A/B/C	61 140	180	16 44	17 46	18 48	19 49	14 38	14 41	16 44	18 47
T-43 B737	81 115	148	10 28	12 30	13 32	14 33	10 26	11 28	13 31	16 35

3. TEMPERATURE ERRORS

(AFFSA/AFFSA LTR)

a. Pressure altimeters are calibrated to indicate true altitudes under International Standard Atmospheric (ISA) conditions. Any deviation from these standard conditions will result in an erroneous reading on the altimeter. This error becomes important when considering obstacle clearances in temperatures lower than standard since the aircraft's altitude is below the figure indicated by the altimeter.

b. The error is proportional to the difference between actual and ISA temperature and the height of the aircraft above the altimeter setting source. Height above altimeter source is considered to be published HAT or HAA for the approach. The amount of error is approximately 4 feet per thousand feet for each degree Celsius of difference.

c. Corrections will only be made for Decision Heights (DHs), Minimum Descent Altitudes (MDAs), and other altitudes inside, but not including, the Final Approach Fix (FAF). The same correction made to DHs and MDAs can be applied to the other altitudes inside the FAF.

CONVERSION TABLES D-15

TEMPERATURE CORRECTION CHART (FEET)

AIRPORT TEMP °C

0	0	20	20	20	40	40	40	40	60	80	90	110	120	140	180	240	300
-5	10	20	30	30	50	50	60	60	80	110	120	150	160	180	240	320	400
-10	20	20	40	40	60	60	80	80	100	130	150	180	200	230	300	400	500
-15	20	30	50	50	70	80	90	100	120	160	180	220	240	280	360	480	600
-20	20	40	60	60	80	100	100	120	140	180	210	250	280	320	420	560	700
-25	30	50	60	70	90	110	120	140	160	210	240	290	320	370	480	640	800
-30	40	60	60	80	100	120	140	160	180	240	270	330	360	410	540	720	900
-35	40	60	70	90	110	130	150	180	200	260	300	360	400	460	600	800	1000
-40	40	60	80	100	120	140	160	200	220	290	330	400	440	510	660	880	1100
-45	50	70	90	110	140	160	180	210	240	310	360	430	480	550	720	960	1200
-50	60	80	100	120	160	180	200	220	260	340	390	470	520	600	780	1040	1300
	200	300	400	500	600	700	800	900	1000	1300	1500	1800	2000	2300	3000	4000	5000

HAT/HAA

EXAMPLE: HI TAC Rwy 11 - Minot AFB, temp minus 30°C. (CAT "D")

NOTE: Must round interpolated values to nearest 10 feet.

	<u>ALTITUDE</u>	<u>HAT/HAA</u>	<u>CORRECTION</u>	<u>CORRECTED ALTITUDE</u>
MDA STR IN	2000' MSL	332'	+60'	2060' MSL
CIRCLING MDA	2200' MSL	552'	+90'	2290' MSL

4. FREQUENCY PAIRING PLAN

The following is a list of VHF/UHF NAVAID FREQUENCY CHANNELING AND PAIRING:

							DME AIRBORNE INTERROGATE			DME GND REPLY	
DME CHN NO.	FREQUENCY				MLS CHN NO.	FREQ	PULSE CODE			DME FREQ	PC US
	LOC	GS	VHF/ VOR	MLS			NORMAL	P/DME			
							DME US	IA US	FA US		
1X	-	-	134.40	-	-	1025	12	--	--	962	12
1Y	-	-	134.45	-	-	1025	36	--	--	1088	30
2X	-	-	134.50	-	-	1026	12	--	--	963	12
2Y	-	-	134.55	-	-	1026	36	--	--	1089	30
3X	-	-	134.60	-	-	1027	12	--	--	964	12
3Y	-	-	134.65	-	-	1027	36	--	--	1090	30
4X	-	-	134.70	-	-	1028	12	--	--	965	12
4Y	-	-	134.75	-	-	1028	36	--	--	1091	30
5X	-	-	134.80	-	-	1029	12	--	--	966	12
5Y	-	-	134.85	-	-	1029	36	-	-	1092	30
6X	-	-	134.90	-	-	1030	12	-	-	967	12
6Y	-	-	134.95	-	-	1030	36	-	-	1093	30
7X	-	-	135.00	-	-	1031	12	-	-	968	12
7Y	-	-	135.05	-	-	1031	36	-	-	1094	30
8X	-	-	135.10	-	-	1032	12	-	-	969	12

D-16 CONVERSION TABLES

							DME AIRBORNE INTERROGATE			DME GND REPLY	
DME CHN NO.	FREQUENCY				MLS CHN NO.	FREQ	PULSE CODE			DME FREQ	PC US
	LOC	GS	VHF/ VOR	MLS			NORMAL	P/DME			
							DME US	IA US	FA US		
8Y	-	-	135.15	-	-	1032	36	-	-	1095	30
9X	-	-	135.20	-	-	1033	12	-	-	970	12
9Y	-	-	135.25	-	-	1033	36	-	-	1096	30
10X	-	-	135.30	-	-	1034	12	-	-	971	12
10Y	-	-	135.35	-	-	1034	36	-	-	1097	30
11X	-	-	135.40	-	-	1035	12	-	-	972	12
11Y	-	-	135.45	-	-	1035	36	-	-	1098	30
12X	-	-	135.50	-	-	1036	12	-	-	973	12
12Y	-	-	135.55	-	-	1036	36	-	-	1099	30
13X	-	-	135.60	-	-	1037	12	-	-	974	12
13Y	-	-	135.65	-	-	1037	36	-	-	1100	30
14X	-	-	135.70	-	-	1038	12	-	-	975	12
14Y	-	-	135.75	-	-	1038	36	-	-	1101	30
15X	-	-	135.80	-	-	1039	12	-	-	976	12
15Y	-	-	135.85	-	-	1039	36	-	-	1102	30
16X	-	-	135.90	-	-	1040	12	-	-	977	12
16Y	-	-	135.95	-	-	1040	36	-	-	1103	30
17X	-	-	108.00	-	-	1041	12	-	-	978	12
17Y	-	-	108.05	5043.0	540	1041	36	36	42	1104	30
18X	108.10	334.70	108.10	5031.0	500	1042	12	12	18	979	12
18Y	108.15	334.55	108.15	5043.6	542	1042	36	36	42	1105	30
19X	-	-	108.20	-	-	1043	12	-	-	980	12
19Y	108.25	-	108.25	5044.2	544	1043	36	36	42	1106	30
20X	108.30	334.10	108.30	5031.6	502	1044	12	12	18	981	12
20Y	108.35	333.95	108.35	5044.8	546	1044	36	36	42	1107	30
21X	-	-	108.40	-	-	1045	12	-	-	982	12
21Y	-	-	108.45	5045.4	548	1045	36	36	42	1108	30
22X	108.50	329.90	108.50	5032.2	504	1046	12	12	18	983	12
22Y	108.55	329.75	108.55	5046.0	550	1046	36	36	42	1109	30
23X	-	-	108.60	-	-	1047	12	-	-	984	12
23Y	-	-	108.65	5046.6	552	1047	36	36	42	1110	30
24X	108.70	330.50	108.70	5032.8	506	1048	12	12	18	985	12
24Y	108.75	330.35	108.75	5047.2	554	1048	36	36	42	1111	30
25X	-	-	108.80	-	-	1049	12	-	-	986	12
25Y	-	-	108.85	5047.8	556	1049	36	36	42	1112	30
26X	108.90	329.30	108.90	5033.4	508	1050	12	12	18	987	12
26Y	108.95	329.15	108.95	5048.4	558	1050	36	36	42	1113	30
27X	-	-	109.00	-	-	1051	12	-	-	988	12
27Y	-	-	109.05	5049.0	560	1051	36	36	42	1114	30
28X	109.10	331.40	109.10	5034.0	510	1052	12	12	18	989	30
28Y	109.15	331.25	109.15	5049.6	562	1052	36	36	42	1115	30
29X	-	-	109.20	-	-	1053	12	-	-	990	12
29Y	-	-	109.25	5050.2	564	1053	36	36	42	1116	30
30X	109.30	332.00	109.30	5034.6	512	1054	12	12	18	991	12
30Y	109.35	331.85	109.35	5050.8	566	1054	36	36	42	1117	30

CONVERSION TABLES D-17

							DME AIRBORNE INTERROGATE			DME GND REPLY	
DME CHN NO.	FREQUENCY				MLS CHN NO.	FREQ	PULSE CODE			DME FREQ	PC US
	LOC	GS	VHF/ VOR	MLS			NORMAL	P/DME			
								DME US	IA US		
31X	-	-	109.40	-	-	1055	12	-	-	992	12
31Y	-	-	109.45	5051.4	568	1055	36	36	42	1118	30
32X	109.50	332.60	109.50	5035.2	514	1056	12	12	18	993	12
32Y	109.55	332.45	109.55	5052.0	570	1056	36	36	42	1119	30
33X	-	-	109.60	-	-	1057	12	-	-	994	12
33Y	-	-	109.65	5052.6	572	1057	36	36	42	1120	30
34X	109.70	333.20	109.70	5035.8	516	1058	12	12	18	995	12
34Y	109.75	333.05	109.75	5035.2	574	1058	36	36	42	1121	30
35X	-	-	109.80	-	-	1059	12	-	-	996	12
35Y	-	-	109.85	5053.8	576	1059	36	36	42	1122	30
36X	109.90	333.80	109.90	5036.4	518	1060	12	12	18	997	12
36Y	109.95	333.65	109.95	5054.4	578	1060	36	36	42	1123	30
37X	-	-	110.00	-	-	1061	12	-	-	998	12
37Y	-	-	110.05	5055.0	580	1061	36	36	42	1124	30
38X	110.10	334.40	110.10	5037.0	520	1062	12	12	18	999	12
38Y	110.15	334.25	110.15								
39X			110.20	-	-	1063	12	-	-	1000	12
39Y	-	-	110.25	5056.2	584	1063	36	36	42	1126	30
40X	110.30	335.00	110.30	5037.6	522	1064	12	12	18	1001	12
40Y	110.35	334.85	110.35	5056.8	586	1064	36	36	42	1127	30
41X	-	-	110.40	-	-	1065	12	-	-	1002	12
41Y	-	-	110.45	5057.4	588	1065	36	36	42	1128	30
42X	110.50	329.60	110.50	5038.2	524	1066	12	12	18	1003	12
42Y	110.55	329.45	110.55	5058.0	590	1066	36	36	42	1129	30
43X	-	-	110.60	-	-	1067	12	-	-	1004	12
43Y	-	-	110.65	5058.6	592	1067	36	36	42	1130	30
44X	110.70	330.20	110.70	5038.8	526	1068	12	12	18	1005	12
44Y	110.75	330.05	110.75	5059.2	594	1068	36	36	42	1131	30
45X	-	-	110.80	-	-	1069	12	-	-	1006	12
45Y	-	-	110.85	5059.8	596	1069	36	36	42	1132	30
46X	110.90	330.80	110.90	5039.4	528	1070	12	12	18	1007	12
46Y	110.95	330.65	110.95	5060.4	598	1070	36	36	42	1133	30
47X	-	-	111.00	-	-	1071	12	-	-	1008	12
47Y	-	-	111.05	5061.0	600	1071	36	36	42	1134	30
48X	111.10	331.70	111.10	5040.0	530	1072	12	12	18	1009	12
48Y	111.15	331.55	111.15	5061.6	602	1072	36	36	42	1135	30
49X	-	-	111.20	-	-	1073	12	-	-	1010	12
49Y	-	-	111.25	6062.2	604	1073	36	36	42	1136	30
50X	111.30	332.30	111.30	5040.6	532	1074	12	12	18	1011	12
50Y	111.35	332.15	111.35	5062.8	606	1074	36	36	42	1137	30
51X	-	-	111.40	-	-	1075	12	-	-	1012	12
51Y	-	-	111.45	5063.4	608	1075	36	36	42	1136	30
52X	111.50	332.90	111.50	5041.2	534	1076	12	12	18	1013	12
52Y	111.55	332.75	111.55	5064.0	610	1076	36	36	42	1139	30
53X	-	-	111.60	-	-	1077	12	-	-	1014	12

D-18 CONVERSION TABLES

							DME AIRBORNE INTERROGATE			DME GND REPLY	
DME CHN NO.	FREQUENCY				MLS CHN NO.	FREQ.	PULSE CODE			DME FREQ.	PC US
	LOC	GS	VHF/ VOR	MLS			NORMAL DME US	P/DME IA US	FA US		
53Y	-	-	111.65	5064.4	612	1077	36	36	42	1140	30
54X	111.70	333.50	111.70	5041.8	536	1078	12	12	18	1015	12
54Y	111.75	333.35	111.75	5065.2	614	1078	36	36	42	1141	30
55X	-	-	111.80	-	-	1079	12	-	-	1016	12
55Y	-	-	111.85	5065.8	616	1079	36	36	42	1142	30
56X	111.90	331.10	111.90	5042.4	538	1080	12	12	18	1017	12
56Y	111.95	330.95	111.95	5066.4	618	1080	36	36	42	1143	30
57X	-	-	112.00	-	-	1081	12	-	-	1018	12
57Y	-	-	112.05	-	-	1081	36	-	-	1144	30
58X	-	-	112.10	-	-	1082	12	-	-	1019	12
58Y	-	-	112.15	-	-	1082	36	-	-	1145	30
59X	-	-	112.20	-	-	1083	12	-	-	1020	12
59Y	-	-	112.25	-	-	1083	36	-	-	1146	30
60X	-	-	133.30	-	-	1084	12	-	-	1021	12
60Y	-	-	133.35	-	-	1084	36	-	-	1147	30
61X	-	-	133.40	-	-	1085	12	-	-	1022	12
61Y	-	-	133.45	-	-	1085	36	-	-	1148	30
62X	-	-	133.50	-	-	1086	12	-	-	1023	12
62Y	-	-	133.55	-	-	1086	36	-	-	1149	30
63X	-	-	133.60	-	-	1087	12	-	-	1024	12
63Y	-	-	133.65	-	-	1087	36	-	-	1150	30
64X	-	-	133.70	-	-	1088	12	-	-	1151	12
64Y	-	-	133.75	-	-	1088	36	-	-	1025	30
65X	-	-	133.80	-	-	1089	12	-	-	1152	12
65Y	-	-	133.85	-	-	1089	36	-	-	1026	30
66X	-	-	133.90	-	-	1090	12	-	-	1153	12
66Y	-	-	133.95	-	-	1090	36	-	-	1027	30
67X	-	-	134.00	-	-	1091	12	-	-	1154	12
67Y	-	-	134.05	-	-	1091	36	-	-	1028	30
68X	-	-	134.10	-	-	1092	12	-	-	1155	12
68Y	-	-	134.15	-	-	1092	36	-	-	1029	30
69X	-	-	134.20	-	-	1093	12	-	-	1156	12
69Y	-	-	134.25	-	-	1093	36	-	-	1030	30
70X	-	-	112.30	-	-	1094	12	-	-	1157	12
70Y	-	-	112.35	-	-	1094	36	-	-	1031	30
71X	-	-	112.40	-	-	1095	12	-	-	1158	12
71Y	-	-	112.45	-	-	1095	36	-	-	1032	30
72X	-	-	112.50	-	-	1096	12	-	-	1159	12
72Y	-	-	112.55	-	-	1096	36	-	-	1033	30
73X	-	-	112.60	-	-	1097	12	-	-	1160	12
73Y	-	-	112.65	-	-	1097	36	-	-	1034	30
74X	-	-	112.70	-	-	1098	12	-	-	1161	12
74Y	-	-	112.75	-	-	1098	36	-	-	1035	30
75X	-	-	112.80	-	-	1099	12	-	-	1162	12
75Y	-	-	112.85	-	-	1099	36	-	-	1036	30

CONVERSION TABLES D-19

							DME AIRBORNE INTERROGATE			DME GND REPLY	
DME CHN NO.	FREQUENCY				MLS CHN NO.	FREQ	PULSE CODE			DME FREQ	PC US
	LOC	GS	VHF/ VOR	MLS			NORMAL	P/DME			
							DME US	IA US	FA US		
76X	-	-	112.90	-	-	1100	12	-	-	1163	12
76Y	-	-	112.95	-	-	1100	36	-	-	1037	30
77X	-	-	113.00	-	-	1101	12	-	-	1164	12
77Y	-	-	113.05	-	-	1101	36	-	-	1038	30
78X	-	-	113.10	-	-	1102	12	-	-	1165	12
78Y	-	-	113.15	-	-	1102	36	-	-	1039	30
79X	-	-	113.20	-	-	1103	12	-	-	1166	12
79Y	-	-	113.25	-	-	1103	36	-	-	1040	30
80X	-	-	113.30	-	-	1104	12	-	-	1167	12
80Y	-	-	113.35	5067.0	620	1104	36	36	42	1041	30
81X	-	-	113.40	-	-	1105	12	-	-	1168	12
81Y	-	-	113.45	5067.6	622	1105	36	36	42	1042	30
82X	-	-	113.50	-	-	1106	12	-	-	1169	12
82Y	-	-	113.55	5068.2	624	1106	36	36	42	1043	30
83X	-	-	113.60	-	-	1107	12	-	-	1170	12
83Y	-	-	113.65	5068.8	626	1107	36	36	42	1044	30
84X	-	-	113.70	-	-	1108	12	-	-	1171	12
84Y	-	-	113.75	5069.4	628	1108	36	36	42	1045	30
85X	-	-	113.80	-	-	1109	12	-	-	1172	12
85Y	-	-	113.85	5070.0	630	1109	36	36	42	1046	30
86X	-	-	113.90	-	-	1110	12	-	-	1173	12
86Y	-	-	113.95	5070.6	632	1110	36	36	42	1047	30
87X	-	-	114.00	-	-	1111	12	-	-	1174	12
87Y	-	-	114.05	5071.2	634	1111	36	36	42	1048	30
88X	-	-	114.10	-	-	1112	12	-	-	1175	12
88Y	-	-	114.15	5071.8	636	1112	36	36	42	1049	30
89X	-	-	114.20	-	-	1113	12	-	-	1176	12
89Y	-	-	114.25	5072.4	638	1113	36	36	42	1050	30
90X	-	-	114.30	-	-	1114	12	-	-	1177	12
90Y	-	-	114.35	5073.0	640	1114	36	36	42	1051	30
91X	-	-	114.40	-	-	1115	12	-	-	1178	12
91Y	-	-	114.45	5073.6	642	1115	36	36	42	1052	30
92X	-	-	114.50	-	-	1116	12	-	-	1179	12
92Y	-	-	114.55	5074.2	644	1116	36	36	42	1053	30
93X	-	-	114.60	-	-	1117	12	-	-	1180	12
93Y	-	-	114.65	5074.8	646	1117	36	36	42	1054	30
94X	-	-	114.70	-	-	1118	12	-	-	1181	12
94Y	-	-	114.75	5075.4	648	1118	36	36	42	1055	30
95X	-	-	114.80	-	-	1119	12	-	-	1182	12
95Y	-	-	114.85	5076.0	650	1119	36	36	42	1056	30
96X	-	-	114.90	-	-	1120	12	-	-	1183	12
96Y	-	-	114.95	5076.6	652	1120	36	36	42	1057	30
97X	-	-	115.00	-	-	1121	12	-	-	1184	12
97Y	-	-	115.05	5077.2	654	1121	36	36	42	1058	30
98X	-	-	115.10	-	-	1122	12	-	-	1185	12

D-20 CONVERSION TABLES

DME CHN NO.						DME AIRBORNE INTERROGATE			DME GND REPLY		
						PULSE CODE					
	LOC	FREQUENCY GS	VHF/ VOR	MLS	MLS CHN NO.	FREQ	NORMAL DME US	P/DME IA US	FA US	DME FREQ	PC US
98Y	-	-	115.15	5077.8	656	1122	36	36	42	1059	30
99X	-	-	115.20	-	-	1123	12	-	-	1186	12
99Y	-	-	115.25	5078.4	658	1123	36	36	42	1060	30
100X	-	-	115.30	-	-	1124	12	-	-	1187	12
100Y	-	-	115.35	5079.0	660	1124	36	36	42	1061	30
101X	-	-	115.40	-	-	1125	12	-	-	1188	12
101Y	-	-	115.45	5079.6	662	1125	36	36	42	1062	30
102X	-	-	115.50	-	-	1126	12	-	-	1189	12
102Y	-	-	115.55	5050.2	664	1126	36	36	42	1063	30
103X	-	-	115.60	-	-	1127	12	-	-	1190	12
103Y	-	-	115.65	5080.8	666	1127	36	36	42	1064	30
104X	-	-	115.70	-	-	1128	12	-	-	1191	12
104Y	-	-	115.75	5081.4	668	1128	36	36	42	1065	30
105X	-	-	115.80	-	-	1129	12	-	-	1192	12
105Y	-	-	115.85	5082.0	670	1129	36	36	42	1066	30
106X	-	-	115.90	-	-	1130	12	-	-	1193	12
106Y	-	-	115.95	5082.6	672	1130	36	36	42	1067	30
107X	-	-	116.00	-	-	1131	12	-	-	1194	12
107Y	-	-	116.05	5083.2	674	1131	36	36	42	1068	30
108X	-	-	116.10	-	-	1132	12	-	-	1195	12
108Y	-	-	116.15	5083.8	676	1132	36	36	42	1069	30
109X	-	-	116.20	-	-	1133	12	-	-	1196	12
109Y	-	-	116.25	5084.4	678	1133	36	36	42	1070	30
110X	-	-	116.30	-	-	1134	12	-	-	1197	12
110Y	-	-	116.35	5085.0	680	1134	36	36	42	1071	30
111X	-	-	116.40	-	-	1135	12	-	-	1198	12
111Y	-	-	116.45	5085.6	682	1135	36	36	42	1072	30
112X	-	-	116.50	-	-	1136	12	-	-	1199	12
112Y	-	-	116.55	5086.2	684	1136	36	36	42	1073	30
113X	-	-	116.60	-	-	1137	12	-	-	1200	12
113Y	-	-	116.65	5086.8	686	1137	36	36	42	1074	30
114X	-	-	116.70	-	-	1138	12	-	-	1201	12
114Y	-	-	116.75	5087.4	688	1138	36	36	42	1075	30
115X	-	-	116.80	-	-	1139	12	-	-	1202	12
115Y	-	-	116.85	5088.0	690	1139	36	36	42	1076	30
116X	-	-	116.90	-	-	1140	12	-	-	1203	12
116Y	-	-	116.95	5088.6	692	1140	36	36	42	1077	30
117X	-	-	117.00	-	-	1141	12	-	-	1204	12
117Y	-	-	117.05	5089.2	694	1141	36	36	42	1078	30
118X	-	-	117.10	-	-	1142	12	-	-	1205	12
118Y	-	-	117.15	5089.8	696	1142	36	36	42	1079	30
119X	-	-	117.20	-	-	1143	12	-	-	1206	12
119Y	-	-	117.25	5090.4	698	1143	36	36	42	1080	30
120X	-	-	117.30	-	-	1144	12	-	-	1207	12
120Y	-	-	117.35	-	-	1144	36	-	-	1081	30

CONVERSION TABLES D-21

							DME AIRBORNE INTERROGATE			DME GND REPLY	
DME CHN NO.	FREQUENCY				MLS CHN NO.	FREQ	PULSE CODE			DME FREQ	PC US
	LOC	GS	VHF/ VOR	MLS			NORMAL	P/DME			
							DME US	IA US	FA US		
121X	-	-	117.40	-	-	1145	12	-	-	1208	12
121Y	-	-	117.45	-	-	1145	36	-	-	1082	30
122X	-	-	117.50	-	-	1146	12	-	-	1209	12
122Y	-	-	117.55	-	-	1146	36	-	-	1083	30
123X	-	-	117.60	-	-	1147	12	-	-	1210	12
123Y	-	-	117.65	-	-	1147	36	-	-	1084	30
124X	-	-	117.70	-	-	1148	12	-	-	1211	12
124Y	-	-	117.75	-	-	1148	36	-	-	1085	30
125X	-	-	117.80	-	-	1149	12	-	-	1212	12
125Y	-	-	117.85	-	-	1149	36	-	-	1086	30
126X	-	-	117.90	-	-	1150	12	-	-	1213	12
126Y	-	-	117.95	-	-	1150	36	-	-	1087	30
(FCC/NGA-NACO)											

(FCC/NGA-NACO)

**INTENTIONALLY
LEFT
BLANK**

SECTION E**STANDARD TIME SIGNALS****TABLE OF CONTENTS**

	<u>PAGE NO.</u>
BBC Radio Time Signals	E-3
Canadian Time Signals	E-2
Standard Time Zones of the World	E-4
Station JJY, Tokyo	E-2
U.S. Naval Observatory	E-2
VNG Llandilo - NSW, Australia	E-3
WWV and WWVH	E-2

E-2 STANDARD TIME SIGNALS

1. WWV AND WWVH

a. WWV and WWVH continuously broadcast nominal frequencies and time consistent with the internationally agreed upon time scale, Coordinated Universal Time (UTC) on 2.5, 5, 10, 15 and 20 MHz.

(1) Station Identification is made by voice announcement in English every thirty minutes approximately on the hour and the half hour. Periods with no Audio Tones or Special Announcements, during which the Carrier, Second Ticks, Time Announcements and 100 Hz modified IRIG H Time Code continue, occur from 45 to 50 minutes after the hour at WWV, and from 15 to 20 minutes after the hour at WWVH.

(2) The Time System used is Coordinated Universal Time (UTC), expressed in terms of a 24-hour clock, and is given in a voice announcement every minute preceding the return of the Audio Tone.

EXAMPLE: 1435 UTC would be: "At the tone - fourteen hours, thirty five minutes Coordinated Universal Time."

(3) The Time and Frequency Signals broadcast by WWV may be heard live via telephone by calling WATTS (303) 499-7111. This service is automatically limited to 3 minutes per call. Similar time-of-day broadcasts from WWVH can be heard by calling (808) 335-4363 on the Island of Kauai through the overseas operator.

NOTE: The specific hour and minute mentioned is actually the time in the time zone centered around Greenwich, England, and may be better known as "Greenwich Mean Time" (GMT).

2. STATION JJY, TOKYO

a. Station JJY Time Signals are in the form of an interruption of the Carrier Wave for 20 milli-seconds before the second and 200 milli-seconds before the minute. The end of each interruption is the exact time. The signals are broadcast on the following times:

2.5 MHz -	0659 to 2259Z
4 MHz and 5 MHz -	24 hours
8 MHz and 10 MHz -	2059 to 1059Z

b. The standard 1000 Hz carrier is omitted 4 minutes beginning at 0000 UTC. The 5th minute, from the 23rd to the 57th second, will be the Identification Signals on 1000 Hz/S modulation as follows:

Call Sign	Twice
Time Code	Once (24 hour JST)
Warning Code	Five (5) times
W	Abnormal
U	Unstable
N	Normal
Voice Announcement	(except 4000 kHz)
Call Sign	Twice
Time	(24 hour JST) once in Japanese and once in English

3. U.S. NAVAL OBSERVATORY

(NAVFIC/NAVFIC FIL)

U.S. Naval Observatory master clock time may be obtained via telephone by calling DSN 762-1401, C202-762-1401. This service is limited to approximately one minute. Alternate USN master clock at Falcon AFB, CO DSN 560-6742 C719-567-6742.

4. CANADIAN TIME SIGNALS

STATION CHU, OTTAWA, ONTARIO, operates continuously on the following frequencies: 3330 kHz, 7335 kHz, and 14670 kHz. The second pulses consist of 300 cycles of a 1000 Hz tone with certain omissions and identifications. Omission of the 29th pulse identifies the half minute and omission of the 51st to 59th pulse provides a window for voice announcement. Zero pulse of each minute is 1/2 second long and the hour is identified by a pulse of one full second followed by 40 seconds of silence. The bilingual voice announcement which is heard each minute takes the form: "CHU CANADA-EASTERN STANDARD TIME- -HOURS- -MINUTES- -HEURES- -MINUTES" (English

STANDARD TIME SIGNALS E-3

on even minutes, French on odd) and on the hour "CHU CANADA-EASTERN STANDARD TIME- - HOURS EXACTLY,- -HEURES PRECISES".

5. BBC RADIO TIME SIGNALS

The time signal consists of five short "pips" from second 55 to second 59, followed by a lengthened pip, the start of which marks the minute to an accuracy of 261 1/20 second. The duration of each short pip is 100 milliseconds and that of the long pip is 500 milliseconds.

TIME OF EMISSION (GMT)				
	FREQ (kHz)	MON-FRI	SAT	SUN
BBC RADIO 1	1053	0530	0600	0600
	1089	0600	1300	1700
		0700	1930	2400
		0800	2400	
		2200		
BBC RADIO 4	198	2400		
		0200	0200	0200
		0300	0300	0300
		0400	0400	0400
		0500	0500	0500
		0600	0600	0600
		0700	0700	0700
	720	0800	0800	0800
		0900	0900	0900
		1000	1000	1300
		1100	1100	1600
		1200	1300	1700
		1300	1400	1800 (B)
		1400	1500	1900
		1500	1800 (B)	2100
		1600 ①	2200 (B)	2200 (B)
		1700	2400 (B)	2400 (B)
		1800 (B)		
		1900		
		2400 (B)		

① Not Mon.

(B) BIG BEN

6. VNG LLANDILO - NSW, AUSTRALIA

a. Air Services Australia provides a time signal broadcast service from its transmitters located at Llandilo NSW VNG

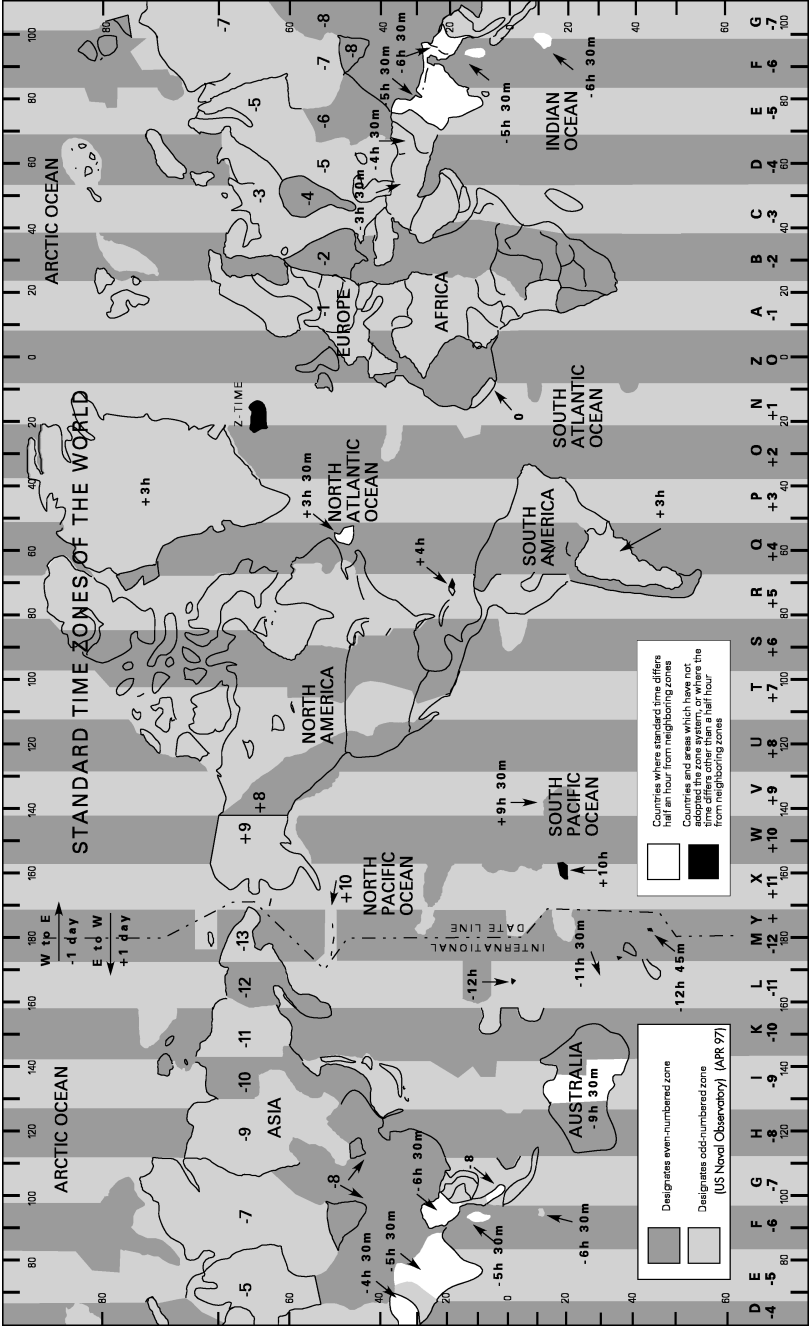
b. The transmission schedule is as follows:

FREQ (MHZ)	TIME	POWER (KW)
2.5	H24	1.0
5.0	H24	10.0
16.0	2200-1000Z	5.0

c. The VNG station identification is given each quarter hour.

d. The start of each minute is marked by a 500 millisecond pulse. Normal second markers are 50 milliseconds long. Seconds number 55-58 are only 5 milliseconds long; in minutes number 5, 10, 15, etc, seconds number 50-58 are only 5 milliseconds long. Second number 59 is always omitted.

E-4 STANDARD TIME SIGNALS



SECTION F

FLIP AND NOTAM
ABBREVIATIONS/CODE

TABLE OF CONTENTS

PAGE NO.

FLIP and NOTAM Abbreviations F-2

National Flight Data Center (NFDC) FDC NOTAM Contractions F-39

NOTAM Code..... F-30

F-2 FLIP AND NOTAM ABBREVIATIONS

1. FLIP and NOTAM ABBREVIATIONS - This listing provides a ready reference of abbreviations used in Flight Information Publications (FLIPs) and the DoD NOTAM System. Codes, e.g., POL, Lighting, JASU etc., are listed elsewhere in the Supplement Legends. The abbreviations presented are intended to represent grammatical variations of the basic form. (Example - "trans" may mean "transmit", "transmitting", "transmitted," or "transmits.")

A		act	activity
A	Alert Area (followed by identification)	ACW	Aircraft Control and Warning
A	Area Chart (followed by identification)	A/D	Aerodrome
AA	Aruba	ADA	Advisory Area
A/A	air to air	ADC	Aerospace Defense Command
AAF	Army Air Field	ADCC	Air Defense Control Center
AAI	Angle of Approach Indicator	ADCF	air defense control facility
AAL	above airport level	ADCUS	Advise Customs
AAL	Aircraft Approach Limitations	ADDC	Air Defense Direction Center
AAS	Airport Advisory Service	addn	addition
AB	Airbase	ADF	Automatic Direction Finder
abm	abeam	ADIZ	Air Defense Identification Zone
ABn	Aerodrome Beacon	adj	adjacent
abt	about	admin	administration
abv	above	ADR	Advisory Route
AC	Antigua, Barbuda	adv	advise
ACA	Arctic Control Area	advy	advisory
ACC	Air Combat Command	AE	United Arab Emirates
ACC	Area Control Center	AEIS	Aeronautical Enroute Information Service
ACCID	notification of aircraft accident	AER	Approach End of Runway
accom	accommodate	AF	Afghanistan
acft	aircraft	AFA	Army Flight Activity
ACL	altimeter check location	AFB	Air Force Base
ACLS	Automatic Carrier Landing System	afct	affect
ACN	Aircraft Classification Number	AFFF	Aqueous Film Forming Foam
acpt	accept	AFFSA	Air Force Flight Standards Agency
		AFHP	Air Force Heliport

FLIP AND NOTAM ABBREVIATIONS F-3

AFI	African/Indian Ocean (ICAO Region, Air Force Instruction	AIRNAVO	US Navy Air Navigation Office
AFIL	Flight plan filed while airborne	AIS	Aeronautical Information Services
AFIO	Authorization for Fighter Interceptor Operations	AJ	Azerbaijan
AFIS	Aerodrome Flight Information Service	AL	Albania
afld	airfield	AL	Approach and Landing Chart
AFM	Air Force Manual	ALA	alighting area
AFMC	Air Force Material Command	ALERFA	alert phase
AFOD	US Army Flight Operations Detachment	ALF	Auxiliary Landing Field
AFR	Air Force Regulation	ALS	Approach Light System
AFRC	Armed Forces Reserve Center	ALSF	High Intensity ALS Category 1 configuration (code)
AFRC	Air Force Reserve Command	ALSF-1	High Intensity ALS Category I configuration with sequenced Flashers (code)
AFRS	Armed Forces Radio Stations	ALSF-2	High Intensity ALS Category II configuration with sequenced Flashers (code)
aft	after	alt	altitude
AFTN	Aeronautical Fixed Telecommunication Network	altn	alternate
AG	Agriculture	ALTRV	Altitude Reservation
AG	Algeria	AM	Amplitude Modulation
A/G	air/ground	AM	ante meridiem, midnight to noon
A-G	Arresting Gear	AM	Armenia
AGA	airfield or air routes ground aids	AMC	Air Mobility Command
agcy	Agency	amd	amend
A-GEAR	Arresting Gear	amdt	amendment
AGL	above ground level	ammo	ammunition
agn	again	AMSL	Above Mean Sea Level
AHP	Army heliport	ANG	Air National Guard
AIP	Aeronautical Information Publication	ANGS	Air National Guard Station
AIRAC	aeronautical information regulation and control	ANO	Air Navigation Order
AIREP	Air Reports (Metro in Plain Language)	ant	antenna

F-4 FLIP AND NOTAM ABBREVIATIONS

AO	Angola	ARS	Air Rescue Service/Air Reserve Station
AOE	Airport/Aerodrome of Entry	ARSA	Airport RADAR Service Area
apch	approach	ARSR	Air Route Surveillance Radar
apn	apron	ARTC	Air Route Traffic Control
APO	Air Force or Army Post Office	ARTCC	Air Route Traffic Control Center
APP CON	Approach Control	AS	Air Station
Apr	April	AS	Australia
aprx	approximate	ASAP	as soon as possible
APU	Auxiliary Power Unit	ASDA	accelerate - stop distance available
APV	Approach with Vertical Guidance	ASDE	Airport Surface Detection Equipment
apv	approve	asgn	assign
apvl	approval	ASL	Above Sea Level
AQ	American Samoa	ASOS	Automatic Surface Observing System
AR	Aerial Refueling	ASR	Airport Surveillance Radar
AR	Argentina	ASRgn	Altimeter Setting Region
AR	Army Reserve, Air Receive	ASU	Aircraft Starting Unit
ARB	Air Reserve Base	AT	Air Transmit
ARC	Area of Responsibility Center	ATA	Actual Time of Arrival
ARCAL (Canada)	Aircraft Radio Control of Aerodrome Lighting	ATC	Air Traffic Control
ARCP	Air Refueling Control Point	ATC	Air Training Command
ARCT	Air Refueling Control Time	ATCAA	Air Traffic Control Assigned Airspace
ARFOR	Area Forecast	ATCC	Air Traffic Control Center
ARINC	Aeronautical Radio Inc.	ATCOM	Air Traffic Control Communications (Ship to Shore)
ARIP	Air Refueling Initial Point	ATCRBS	Air Traffic Control Radar Beacon System
arng	arrange	ATD	Actual Time of Departure
ARNG	Army National Guard	ATD	Along Track Distance
ARO	ATS Reporting Office	ATF	Automatic Terrain Following
ARP	Airport Reference Point	ATFM	Air Traffic Flow Management
arpt	airport		
arr	arrive		

FLIP AND NOTAM ABBREVIATIONS F-5

ATIS	Automatic Terminal Information Service	bcn	beacon
ATS	Air Traffic Service	bcst	broadcast
attn	attention	BD	Bermuda
ATZ	airport traffic zone	bdry	boundary
AU	Austria	BE	Belgium
Aug	August	BEQ	Bachelor Enlisted Quarters
auth	authority	BF	The Bahamas
auto	automatic	BG	Bangladesh
AUW	All Up Weight (gross weight)	BH	Belize
aux	auxiliary	BK	Bosnia and Herzegovina
AV	Anguilla	BKN	Broken
AVASI	abbreviated VASI	BL	Bolivia
avbl	available	bldg	building
avg	average	blkd	blocked
AvGas	aviation gasoline	blw	below
avn	aviation	BM	bone marker, back marker
AvOil	aviation oil	BM	Burma
avord	aviation ordnance	BN	Benin
AWOS	Automated Weather Observing System	BO	Belarus
AWS	Air Weather Service	BOA	Break-Off Altitude
awt	await	BOH	Break-Off Height
awy	airway	BOQ	Bachelor Officers Quarters
AY	Antarctica	BP	Solomon I
az	azimuth	BR	Brazil
	B	brg	bearing
		brkg	braking
BA	Bahrain	BS	Broadcast Station (commercial)
BA	braking action	btn	between
BASH	Bird Aircraft Strike Hazard	BU	Bulgaria
BB	Barbados	bus	business
BC	back course	BWC	Bird Watch Condition
BC	Botswana	BX	Brunei

F-6 FLIP AND NOTAM ABBREVIATIONS

BY	Burundi	CFMU	Central Flow Management Unit
byd	beyond	CG	Democratic Republic of the Congo
BZ	Buffer Zone	CGAF	Coast Guard Air Facility
	C	CGAS	Coast Guard Air Station
C	Celsius (degrees,) Centigrade (degrees)	CH	channel
C	Center (runway designation)	CH	China
C	Circling Approach (on instrument approach chart)	chan	channel
C	Commercial Circuit (Telephone)	CHAPI	Chase Helicopter Approach Path Indicator
CA	Canada	chg	change
CAC	Centralized Approach Control	cht	chart
		CI	Chile
CALS	combat assault landing strip	cir	circle, circling
cap	capacity	CIS	Commonwealth of Independent States
CAR	Caribbean (ICAO Region)	CIRVIS	Communications Instructions Reporting Vital Intelligence Sightings
CARF	Central Altitude Reservation Facility	CIT	near or over large towns
CAS	Calibrated Airspeed	civ	civil, civilian
cat	category	CJ	Cayman I
CAT	Clear Air Turbulence	ck	check
CAVU	Ceiling and Visibility Unlimited	CK	Cocos (Keeling) I
CB	Crash Boat	cl	class
CCW or cntclkws	counterclockwise	CL	Centerline Lighting System
CD	Chad	clbr	calibration
CDI	Course Direction Indicator	clnc	clearance
CE	Sri Lanka	CLNC DEL	clearance delivery
ceil	ceiling	CLR	Clear
CERAP	Center Radar Approach Control	clsd	closed
CF	Congo	CM	Cameroon
cfm	confirm	CMNPS	Canadian Minimum Navigation Performance Specifications Airspace.

FLIP AND NOTAM ABBREVIATIONS F-7

cmsn	commission	corr	correct
CN	Comoros	cov	cover
CNATRA	Chief of Naval Air Training	crdr	corridor
CNF	Computer Navigation Fix	cros	cross
cnl	cancel	CRP	Compulsory Reporting Point
CNO	Chief of Naval Operations	crs	course
cns	continuous	CRT	Cathode Ray Tube
cnsl	Consolidated	CS	call sign
cntclkws or CCW	counterclockwise	CS	communication station
cntr	center	CS	Costa Rica
CO	Colombia	CSA	Caribbean and South America
CO	Commanding Officer	cstl	coastal, coastline
Co	Company, County	CSTMS	Customs
com	communication	CStn	communication station
comd	command	CT	Central African Republic
Comdr	Commander	CTA	Control Area
comdt	commandant	CTAF	Common Traffic Advisory Frequency
coml	commercial	CTAM	climb to and maintain
compl	complete	ctc	contact
compul	compulsory	ctl	control
comsn	commission	CTLZ	Control Zone
CON	Control (voice call), Consol, Consolan	ctn	caution
conc	concrete	CU	Cuba
cond	condition	CV	Cape Verde
const	construction	CVFP	Chartered Visual Flight Procedure
cont	continue	CVFR	Controlled Visual Flight Rules
CONUS	Continental United States	CW	Clockwise, Continuous Wave, Carrier Wave
convl	conventional	CW	Cook I
coord	coordinate	CWA	Center Weather Advisory
COP	change over point	CWT	hundredweight
copter	helicopter		

F-8 FLIP AND NOTAM ABBREVIATIONS

cwy	clearway	displ	displace
CY	Cyprus	dist	district, distance
D	D	div	division
	Danger Area (followed by identification)	DJ	Djibouti
		DL	Direct Line to FSS
DA	Decision Altitude	dlt	delete
DA	Denmark	dly	daily
DAFIF	Digital Aeronautical Flight Information File	dly	delay
daylt	daylight	DM	Double Master (Loran Stations)
db	decibel	DME	Distance Measuring Equipment (UHF standard, TACAN compatible)
dckg	docking	DND	Department of National Defence (Canada)
dct	direct		
Dec	December		
DECCA	Decca Navigator	DNVT	Digital Non-Secure Voice Telephone
decom	decommission	DO	Dominica
deg	degree	DoD	Department of Defense
del	delivery	dpth	depth
DEMIZ	DEW East Military Identification Zone	DR	Dead Reckoning
DENEB	fog dispersal operations	DR	Dominican Republic
dep	depart	drct	direct
DEP CON	Departure Control	DS	Double Slave (Loran Stations)
DER	Departure End of Runway	DSB	Double Sideband
destn	destination	DSN	Defense Switch Network
det	detachment	DT	Daylight Saving Time
DF	Direction Finder	DTAM	descent to and maintain
DFTI	distance from touchdown indicator	DTU	Data Transfer Unit
dgr	danger	dupe	duplication
DH	Decision Height	dur	duration
direc	directional	dur	during
disc	discontinue	DV	Distinguished Visitor
disem	disseminate	DVFR	Defense Visual Flight Rule

FLIP AND NOTAM ABBREVIATIONS F-9

DVOR	Doppler VOR	EPD	Earliest Practicable Date
E	E	EPI	Expanded Position Indicator
	East	eqpt	equipment
ea	each	ER	Eritrea
EAF	Expeditionary airfield	ERDA	Energy Research and Development Administration
EAT	Expected Approach Time	ES	El Salvador
Ebnd	Eastbound	E-S	Enroute Supplement
EC	Ecuador	est	estimate
ECM	Electronic Counter Measures	estab	establish
ECN	Enroute Change Notice	ET	Ethiopia
EDCT	expected departure clearance time	ETA	Estimated Time of Arrival
EET	estimated elapsed time	ETD	Estimated Time of Departure
EFC	Expect Further Clearance	ETE	Estimated Time Enroute
eff	effect	ETO	estimated time over significant point
EFIS	Electronic Flight Information System	ETS	European Telephone System
EG	Egypt	EU	Europa Island
E-HA	Enroute High Altitude	EUCARF	European Central Altitude Reservation Function
EHF	extremely high frequency (30,000 to 300,000 MHz)	Eur	Eureka
EI	Ireland	Eur	Europe
EK	Equatorial Guinea	EUR	European (ICAO Region)
E-LA	Enroute Low Altitude	ev	every
elev	elevation	evac	evacuate
ELT	Emergency Locator Transmitter	exc	except
em	emission	excl	exclude
emerg	emergency	exer	exercise
EN	Estonia	exm	exempt
eng	engine	exp	expect
enrt	enroute	ext	extent
EOBT	estimated off-block time	extn	extend, extension
EOR	End of Runway	extv	extensive
		EZ	Czech Republic

F-10 FLIP AND NOTAM ABBREVIATIONS

	F	FJ	Fiji
F	Fahrenheit (degrees)	FL	flight level
F	fixed	fld	field
FA	Falkland I	flg	flashing
FAA	Federal Aviation Administration	FLIP	Flight Information Publication
fac	facility	flr	flare
FAF	Final Approach Fix	flt	flight
FACSFAC	Fleet Area Control and Surveillance Facility	fltck	flight check
FAR	Federal Air Regulations	FLT CON	Flight Control
FARP	Forward Arming and Refueling Point	fluc	fluctuate
FAS	Final Approach Speed	flw	follow
FAWS	Flight Advisory Weather Service	FM	Fan Marker, Frequency Modulation
fax	facsimile	FM	Federated States of Micronesia
FBAA	Flying Boat Alighting Area	FMP	Flow Management Position
FBO	Fixed Base Operator	FMS	Flight Management System
FBW	Fly by Wire	FMU	Flow Management Unit
FCC	Flight Control Center	FNA	final approach
FCG	Foreign Clearance Guide	FO	Faroe I
FCLP	field carrier landing practice	FOC	Flight Operations Center
fcst	forecast	FOD	Foreign Object Damage
Feb	February	fone	telephone
FG	French Guiana	FP	French Polynesia
FI	Finland	FPL	Flight Plan
FIC	Flight Information Center	fpm	feet per minute
FIFOR	Flight Forecast (in international MET figures)	FPO	Fleet Post Office
FIH	Flight Information Handbook	fqt	frequent
FI/P	Flight Inspection Permanent	FR	France
FIR	Flight Information Region	fr	from
FIS	Flight Information Service	freq	frequency, frequent
FI/T	Flight Inspection Temporary	Fri	Friday
		frng	firing

FLIP AND NOTAM ABBREVIATIONS F-11

FS	Flight Service	GL	Greenland
FSC	Flight Service Center	gldr	glider
FSL	full stop landing	GLS	GNSS Landing System
FSS	Flight Service Station	GM	Germany
fst	first	GMT	Greenwich Mean Time (when not a figure of time)
ft	foot	gnd	ground
fr	fighter	gndck	ground check
furn	furnish	GND CON	Ground Control
F/W	Fixed Wing	gnry	gunnery
G			
G	grid	GNSS	Global Navigation Satellite System
GA	Gambia	GO	Glorioso Island
GA	Glide Angle	govt	government
G/A	ground-to-air	GP	Glide Path
gal	gallon	Gp	Group
G-,A-,R-,B-	Low Frequency Airways (green, amber, red, blue)	GP	Guadeloupe
GAT	General Air Traffic (Europe-Asia)	GPI	Ground Point of Intercept
GB	Gabon	GPS	Global Positioning System
GCA	Ground Controlled Approach	GQ	Guam
GCAS	Ground Collision Avoidance System	GR	Greece
GCI	Ground Control Intercept	grad	gradient
GCO	Ground Communications Outlet	grav	gravel
GCT	Greenwich Civil Time	grd	guard
gen	general	grdl	gradual
GG	Georgia	Griv	Grivation
GH	Ghana	GS	glide slope
GI	Gibraltar	GT	Guatemala
GJ	Grenada	GV	Grid variation
GK	Guernsey	GV	Guinea
		GWT	gross weight
		GY	Guyana
		GZ	Gaza Strip

F-12 FLIP AND NOTAM ABBREVIATIONS

H		HKSAR	Hong Kong Special Administrative Region
H	Enroute High Altitude Chart (followed by identification)	hldg	holding
H+	Hours or hours plus... minutes past the hour	HN	Sunset to Sunrise
H24	continuous operation	HO	Honduras
HA	Haiti	HO	Service available to meet operational requirements
HAA	Height Above Airport/ Aerodrome	hol	holiday
HAL	Height Above Landing Area	HOLF	Helicopter Outlying Field
HALS	Helicopter Approach Lighting System	horiz	horizontal
HAR	Height Above Runway	hosp	hospital
HAT	Height Above Touchdown	hPa	hectopascal
haz	hazard	HPOX	High Pressure Oxygen
HDF	High Frequency Direction Finder	HPZ	Helicopter Protected Zone
hdg	heading	HQ	Headquarters
HDTA	High Density Traffic Airport/ Aerodrome	HR	Croatia
HF	High Frequency (3000 to 30,000 KHz)	hr	hour
Hg	mercury	HS	service available during hours of scheduled operations
hgr	hangar	hsg	housing
hgt	height	HTA	Helicopter Training Area
hi	high	HU	Hungary
Hi ALT or HA	High Altitude	HVDF	High and Very High Frequency Direction Finder (at the same location)
HIFOR	High Level Forecast	hvy	heavy
HILS	Heliport Instrument Lighting System	HW	Heavy Weight
HIRL	High Intensity Runway Lights	hwy	highway
HIRTA	high intensity radio transmission area	HX	Station having no specific working hours
HIWAS	Hazardous Inflight Weather Advisory Service	Hz	Hertz (cycles per second)
HJ	Sunrise to Sunset	I	I
HK	Hong Kong	I	island
		IACC	Inter-Agency Air Cartographic Committee

FLIP AND NOTAM ABBREVIATIONS F-13

IAF	Initial Approach Fix	immed	immediate
IAL	instrument approach and landing chart	in	inch
IAP	Instrument Approach Procedure	IN	India
IAR	intersection of air routes	INA	initial approach
IAS	Indicated Air Speed	inactv	inactive
IATA	International Air Transport Association	inad	inadvertent
IAW	in accordance with	inbd	inbound
IBn	identification Beacon	INC	In Cloud
IC	Iceland	Inc	Incorporated
ICAO	International Civil Aviation Organization	incl	include
ice	icing	INCR	INCREASE
ICLS	Instrument Carrier Landing System	indef	indefinite
ID	Indonesia	info	information
ident	identification	inop	inoperative
IF	Intermediate Fix	INP	if not possible
IFF	Identification, Friend or Foe	inpr	in progress
IFIM	International Flight Information Manual.	INREQ	information request
IFPS	Integrated Initial Flight Plan Processing System	INS	Inertial Navigation System
IFR	Instrument Flight Rules	inst	instrument
IFR-S	FLIP IFR Supplement	instl	install
IFSS	International Flight Service Station	instr	instruction
IGS	Instrument Guidance System	int	intersection
ILA	Instrument Landing Aid	intcntl	intercontinental
ILS	Instrument Landing System	intcp	intercept
IM	Inner Marker	intl	international
IM	Isle of Man/Ronaldsway	intmed	intermediate
IMC	Instrument Meteorological Conditions	intmt	intermittent
IMG	Immigration	intrg	interrogate
		introd	introduce
		intrp	interrupt
		ints	intense
		intsf	intensify

F-14 FLIP AND NOTAM ABBREVIATIONS

INTXN	Intersection (for Instrument Approach Procedures only)	JOSAC	Joint OperationalSupport Airlift Center
IO	British Indian Ocean Territory	JQ	Johnston Atoll
IP	Initial Point	JRB	Joint Reserve Base
IR	IFR Military Training Route	jtstr	jet stream
IR	Iran	JU	Juan De Nova Island
IS	Israel	Jul	July
ISMLS	Interim Standard Microwave Landing System	Jun	June
			K
isol	isolate	K	Kopter (spoken ICAO ATS route designator)
IT	Italy	KE	Kenya
IV	Ivory Coast	kg	kilograms
IZ	Iraq	KG	Kyrgyzstan
	J	kHz	kilohertz
J	Jet Fuel	KIAS	Knots Indicated Airspeed
J	Jet Route (followed by identification)	KLIZ	Korea Limited Identification Zone (KLIZ is also the ICAO identifier for LORING AFB, ME)
JA	Japan		
JAL	High Altitude Instrument Approach Procedure Chart	km	kilometer
J-bar	jet aircraft barrier	kmh	kilometers per hour
Jan	January	KPa	Kilopascal
JARB	Joint Air Reserve Base	KR	Kiribati
JASU	Jet Aircraft Starting Unit	KS	Republic of Korea
JATO	Jet Assisted Take-Off	KT	Christmas Island
JCS	Joint Chiefs of Staff	Kt or K	Knots
JE	Jersey	KU	Kuwait
JM	Jamaica	kw	kilowatt
JN	Jan Mayen	KZ	Kazakhstan
JNC	Jet Navigation Chart		L
jng	joining	L	Compass locator
JO	Jordan	L	Enroute Low Altitude Chart (followed by identification)
JOAP	Joint Oil Analysis Program	L	Left (Runway designation)

FLIP AND NOTAM ABBREVIATIONS F-15

LA	Laos	LHOX	Low and High Pressure Oxygen
LAAS	Low Altitude Alert System	LI	Liberia
LAHSO	Land And Hold Short Operations	LIH	light intensity high
lat	latitude	LIL	light intensity low
latrl	lateral	LIM	light intensity medium
LAWRS	Limited Aviation Weather Reporting Station	LIRL	Low Intensity Runway Lights
lb	pound (weight)	LLWAS	Low-Level Wind Shear Alert System
lcl	local	LLZ	ICAO Localizer (for ICAO Instrument Approach Procedures only) Note: FAA LOC/LDA parameters are inclusive within ICAO LLZ parameters.
LCN	load classification number	LMM	Compass locator at Middle Marker ILS
LCP	French Peripheral Classification Line	LMT	Local Mean Time
lctd	located	LNAV	Lateral Navigation
lctn	location	lo	low
lctr	locator	LO	Slovakia
LCVASI	Low Cost Visual Approach Slope Indicator	LoALT or LA	Low Altitude
lczr	localizer	LOC	Localizer (For Instrument Approach Procedures only)
LDA	Landing Distance Available	Lo Int	Low Intensity Lights
LDA	Localizer-type Directional Aid	LOM	Compass locator at Outer Marker ILS
ldg	landing	long	longitude
LDI	landing direction indicator	Loran	Long Range Aid to Navigation
LDIN	Lead-in Lights	Loran DM	Loran Double Master
LE	Lebanon	Loran DS	Loran Double Slave
len	length	Loran M	Loran Master
LF	Low Frequency (30 to 300 KHz)	Loran S	Loran Slave
LFR	Low/Medium Frequency Range	LOX	Liquid Oxygen
LG	Latvia	LP	Low Power
lgt	light	LPOX	Low Pressure Oxygen
lgtl	lighted		
LH	Lithuania		

F-16 FLIP AND NOTAM ABBREVIATIONS

LQ	Palmyra Atoll	MALSR	MALS with Runway Alignment Indicator Lights
LR	Long Range, Lead Radial	mand	mandatory
LRA	Landing Rights Airport	mand alt	mandatory altitude
LRRS	Long Range Radar Station	MAP	Missed Approach Point
LSB	lower side band	Mar	March
lt	left	MARA	Military Activity Restricted Area
LT	Lesotho	MARSA	Military Authority Assumes Responsibility for Separation of Aircraft
LTA	Lighter than air	MASMS	Military Airspace Management System
ltd	limited	MATO	Military Air Traffic Operations
ltr	letter	MATZ	Military Aerodrome Traffic Zone
ltrs	liters	max	maximum
LU	Luxembourg	MB	Martinique
lv	leave	mb	millibars
LY	Libya	MB	Mooring Buoys
lyr	layer	MC	Macau
LZ	landing zone	MCA	Minimum Crossing Altitude
M		MCAAF	Marine Corps Auxiliary Air Facility
M	Master (Loran Station)	MCAAS	Marine Corps Auxiliary Air Station
M	meters, magnetic (after a bearing)	MCAB	Marine Corps Air Base
M	Military Circuit (Telephone)	MCAC	Military Common Area Control
MA	Madagascar	MCAF	Marine Corps Air Facility
MAA	Maximum Authorized Altitude	MCAGCC	Marine Corps Air Ground Combat Center
MACC	Military Area Control Center	MCALF	Marine Corps Auxiliary Landing Field
mag	magnetic	MCAS	Marine Corps Air Station
mag brg	magnetic bearing	MCB	Marine Corps Base
maint	maintain, maintenance	MCC	Military Climb Corridor
maj	major		
MALS	Medium Intensity Approach Lighting System		
MALSF	MALS with Sequenced Flashers		

FLIP AND NOTAM ABBREVIATIONS F-17

MCOLF	Marine Corps Outlying Field	MIJI	Meaconing, Intrusion, Jamming, and Interference
MD	Moldova	mil	military
MDA	Minimum Descent Altitude	MIL OVRN	Military Overrun Lights
MDF	Medium Frequency Direction Finder	min	minimum, minute
MEA	Minimum Enroute Altitude	MIN	Montenegro
med	medium	MIRL	Medium Intensity Runway Lights
MEHT	Minimum Eye Height over Threshold	MIS	Meteorological Impact Statement
mem	memorial	misl	missile
MET	Meteorological, Meteorology	MK	The Former Yugoslav Republic of Macedonia
METAR	Aviation Routine Weather Report (in international MET figure code)	mkr	marker (beacon)
METRO	Pilot-to-Metro voice call	ML	Mali
MF	Mandatory Frequency (Canada)	MLS	Microwave Landing System
MF	Mayotte	MM	Middle Marker, ILS
MF	Medium Frequency (300 to 3000 KHz)	MMLS	Mobile Microwave Landing System
MFA	Minimum Flight Altitude	MNPS	Minimum Navigation Performance Specifications
MFA	Military Flying Area (Canada)	mnt	monitor
MFS	Military Flight Service	MO	Morocco
MG	Mongolia	MOA	Military Operations Area
mgr	manager	MOC	minimum obstruction clearance
MH	Montserrat	MOCA	Minimum Obstruction Clearance Altitude
MHDF	Medium and High Frequency Direction Finder (at same location)	mod	moderate
MHVDF	Medium, high and very high Frequency Direction Finder (at same location)	mod	modify
MHz	Megahertz	Mon	Monday
MI	Malawi	mov	move
MID/ASIA	Middle East/Asia (ICAO Region)	MP	maintenance period
MIDIZ	Mid-Canada Identification Zone	MP	Mauritius
		mph	miles per hour (statute)
		MQ	Midway I

F-18 FLIP AND NOTAM ABBREVIATIONS

MR	Mauritania	N	
MR	Medium Range	N	North
MRA	Minimum Reception Altitude	N/A	not applicable
mrk	mark, marker	NA	not authorized (For Instrument Approach Procedure take-off and alternate MINIMA only.)
MSA	Minimum Safe Altitude		
msg	message		
MSL	Mean sea level	NAAS	Naval Auxiliary Air Station
msn	mission	NADC	Naval Air Development Center
MT	Malta	NADEP	Naval Air Depot
mt	mount, mountain	NAES	Naval Air Engineering Station
MTA	Minimum Terrain Clearance Altitude	NAF	Naval Air Facility
MTAF	Mandatory Traffic Advisory Frequency	NALF	Naval Auxiliary Landing Field
MTC	Military Terminal Control	NALO	Naval Air Logistics Office
MTCA	Military Terminal Control Area	NAM	North American (ICAO Region)
mtthly	monthly	NAR	North American Routes for North Atlantic Traffic
MTOW	Maximum Takeoff Weight	NAS	Naval Air Station
mtrs, M or m	meters	NASA	National Aeronautics and Space Administration
MU	Oman	NAT	North Atlantic (ICAO Region)
MUAC	Military Upper Area Control		
multi	multiple	natl	national
muni	municipal	NATO	North Atlantic Treaty Organization
MV	Magnetic Variation	NATOPS	Naval Air Training and Operating Procedures
MV	Maldives		
MVA	Minimum Vectoring Altitude	nav	navigation
MVDF	Medium and Very High Frequency Direction Finder (at same location)	navaid	navigation aid
		NAVFIG	Naval Flight Information Group
MX	Mexico	NAVMTO	Navy Material Transportation Office
MY	Malaysia		
MZ	Mozambique	NAWC	Naval Air Warfare Center
		NAWS	Naval Air Weapons Station
		Nbnd	Northbound

FLIP AND NOTAM ABBREVIATIONS F-19

NC	New Caledonia	NPA	Non-Precision Approach
NCRP	Non-Compulsory Reporting Point	NR	Nauru
NDB	Non-Directional Radio Beacon	Nr or No	number
NE	Niue	NS	Naval Station
NE	Northeast	NS	Suriname
nec	necessary	NSA	Naval Support Activity
NF	Norfolk I	NS ABTMT	Noise abatement
NG	Niger	nstd	nonstandard
ngt	night	NT	Netherlands Antilles
NH	Vanuatu	ntc	notice
NI	Nigeria	NU	Nicaragua
NGA STL	National Geospatial-Intelligence Agency St. Louis	NVD	Night Vision Devices
NL	Netherlands	NVG	Night Vision Goggles
NM	nautical miles	NW	Northwest
nml	normal	NWC	Naval Weapons Center
NO	Norway	NWS	National Weather Service
No or Nr	number	NWS	North Warning System
NOF	International NOTAM Office	NZ	New Zealand
NOLF	Navy Outlying Field		O
NoPT	No Procedure Turn Required (procedure turn shall not be executed without ATC clearance)	O/A	On or about
NORAD	North American Aerospace Defense Command	OAC	Oceanic Area Control, Oceanic Area Control Center
NORDO	Lost communications or no radio installed/available in aircraft	OAS	obstacle assessment surface
NOS	National Ocean Service	OAT	Operational Air Traffic
NOTAM	Notice to Airmen	obsc	obscure
not flt ck	not flight checked	ObsHt	obstacle height
NOTUN	Notice of Unreliability	obsn	observation
Nov	November	obst	obstruction
NP	Nepal	OCA	Obstacle Clearance Altitude
		OCA	Oceanic Control Area
		OCH	obstacle clearance height
		OCL	Obstacle Clearance Limits

F-20 FLIP AND NOTAM ABBREVIATIONS

ocnl	occasional	OUT	Facility off the air, or operational but not suitable for IFR operations-limitations explained
OCon US	Outside Continental Limits of US		
oct	octane	outbd	outbound
Oct	October	OVC	overcast
ODALS	Omnidirectional Approach Lighting System	ovft	overflight
ODO	Operations Duty Officer	ovrn	overrun
offl	official	OWS	Operational Weather Squadron
OFFL BUS	Official business only	OX	Oxygen
OIC	Officer In Charge	OXRB	Oxygen Replacement Bottles
OK	we agree, correct		
OLF	Outlying Field		P
OLS	Optical Landing System	P	Civil Aerodrome available to transient military aircraft
OM	Outer Marker	P	Page (on Area Planning PCN)
ONC	Operational Navigation Chart	P	Planning
OOD	Officer Of the Day	P	Prohibited area (followed by identification)
OPAREA	Operating Area op by operating authority	PA	Paraguay
opr	operate, operator	PAC	Pacific (ICAO Region)
OPS	Operations	PACAF	Pacific Air Forces
O/R	on request	PACOM	Pacific Command
OROCA	Off-Route Obstruction Clearance Altitude	PALS	Precision Approach and Landing Systems (NAVY)
ORTCA	Off-Route Terrain Clearance Altitude	PANS	Procedures for Air Navigation Services
orig	original	PAPI	Precision Approach Path Indicator
O/S	out of service	PAR	Precision Approach Radar
OSV	Ocean Station Vessel	para	paragraph
OT	other times	parl	parallel
otp	on top	pat	pattern
OTR	Oceanic Transition Routes	PAX	Passenger
OTS	Organized Track System	PCA	Positive Control Area
OTS	Out of Service		

FLIP AND NOTAM ABBREVIATIONS F-21

PCN	Pavement Classification Number	POMAR	Position Operational Meteorological Aircraft Report
PCN	Planning Change Notice		
PCZ	Positive Control Zone	POMOLA	Poor Mans Optical Landing System
PDM	Periodic Depot Maintenance	posn	position
PE	Peru	PP	Papua New Guinea
pent	penetrate	PPI	Plan Position Indicator
perm	permanent	PPR	Prior Permission Required
perms	permission	pps	pulse per second
pers	personnel	PRA	Precision Radar Approach (Instrument Approach Procedures Identification only)
PFC	Porous Friction Courses		
PG	Spratly I	prcht	parachute
PIREP	Pilot Report (pertaining to MET conditions)	precip	precipitation
PJE	Parachuting Activities/ Exercises	pref	prefer
PK	Pakistan	PRESAIR	Air Compressors
P/L	plain language	prev	previous
PL	Poland	prim	primary
PLA	practice low approach	prk	park
PLASI	Pulse Light Approach Slope Indicator	PRM	Precision Runway Monitor
p-line	pole/power line	pro	procedure
pln	plan	prob	probable
PM	Panama	proh	prohibited
PM	Post meridiem, noon til midnight	pro tn	procedure turn
PMSV	Pilot-to-Metro Service	prov	provisional
PMRF	Pacific Missile Range Facility	ps	plus
PN	prior notice	PS	Republic of Palau
PNR	point of no return	psia	Pounds per square inch Ambient
PO	Portugal	psig	Pounds per square inch Gage
POB	persons on board	psnl	personal
POL	Petrol, Oils and Lubricants	PSP	Pierced Steel Planking
		pt	point

F-22 FLIP AND NOTAM ABBREVIATIONS

ptcp	participate	RAIL	Runway Alignment Indicator Lights
PTD	Pilot to Dispatcher	RAIZ	Automated Area Information Responders
PTS	Polar Track Structure	RAMCC	Regional Air Movement Control Center
PU	Guinea-Bissau	RAOB	Radiosonde observation
pub	publication	RAPCON	Radar Approach Control (USAF)
publ	publish	RATCF	Radar Air Traffic Control Facility (Navy)
PV	prevailing visibility	RB	Rescue Boat
PVASI	Pulsating Visual Approach Slope Indicator	RBn	Radio Beacon
pvt	private	RBS	Radar Bomb Scoring
pwr	power	RCA	reach cruise altitude
	Q	RCAG	Remote Center Air to Ground Facility
QA	Qatar	RCC	Rescue Coordination Center
QFE	Altimeter Setting above station	RCF	Radar Control Facility (USAF)
QNE	Altimeter Setting of 29.92 inches which provides height above standard datum plane	RCL	runway centerline
QNH	Altimeter Setting which provides height above mean sea level	RCLS	Runway Centerline Light System
qtrs	quarters	RCO	Remote Communications Outlet
quad	quadrant	rcpt	reception
	R	RCR	Runway Condition Reading
R	Ground Receive	rcv	receive
R-	radial (followed by 3 digits- for use on instrument approach charts)	rcvr	receiver
		rdo	radio
R	Restricted Area (followed by identification)	RE	Reunion
R	Right (runway designation)	recog	recognition
RA	Radio Altimeter setting height	reconst	reconstruct
		ref	reference
RACON	Radar Beacon	reful	refueling
rad	radius, radial	reg	regulation, regular
RAF	Royal Air Force	REIL	Runway End Identifier Lights
RAI	runway alignment indicator		

FLIP AND NOTAM ABBREVIATIONS F-23

rel	reliable	RRP	Runway Reference Point
relctd	relocated	RS	Russia
REP	Reporting Point	RSC	Rescue Sub-Center
repl	replace	RSDU	Radar Storm Detection Unit
reps	repairs	RSP	Responder (beacon)
req	request	RSR	Route Surveillance Radar
RFP	Replacement Flight Plan	RSRS	Reduced Same Runway Separation
rg	range	rstd	restricted
Rgn	Region	R/T	Radiotelephony
Rgnl	Regional	RTB	Return to Base
rgt	right	rte	route
rlgd	realigned	RTF	Radiotelephone
RM	Republic of the Marshall Islands	RTG	radio telegraph
rmk	remark	RTR	Remote Transmitter Receiver
RNAV	Area Navigation	RTT	radio teletypewriter
rng	range, radio range	ruf	rough
RNP	Required Navigation Performance	rufness	roughness
RO	Romania	RV	Rescue Vessel
ROC	rate of climb	RVR	Runway Visual Range
ROFOR	Route Forecast (in international MET figure code)	RVSM	Reduced Vertical Separation Minima
RON	Remain Overnight	R/W	Rotary/Wing
Rot Lt or Bcn	Rotating Light or Beacon	RW	Rwanda
RP	Philippines	rwy	runway
RPI	Runway Point of Intercept		S
rpt	repeat	S	Straight-in-Approach (on instrument approach charts)
rpt	report	S	Slave (Loran Stations)
RQ	Puerto Rico	S	South
rqr	require	S	Supersonic (spoken ICAO ATS route designator)
RR	Railroad	SA	Saudi Arabia
RRL	Runway Remaining Lights	SAFE-BAR	Safeland Barrier

F-24 FLIP AND NOTAM ABBREVIATIONS

SALS	Short Approach Lighting System	SELCAL	Selective Calling System
SALSF	SALS with Sequenced Flasher	SEng	Single Engine
SAM	South American (ICAO Region)	Sep	September
SAM	Special Air Mission	sepn	separation
san	sanitary	SES	Senior Executive Service
SAR	Search and Rescue	SF	South Africa
SAR	Special Administrative Region	SFA	Single Frequency Approach
SARA	Search and Rescue Aid	sfc	surface
SARPS	Standards and Recommended Practices	SFL	Sequence Flashing Lights
Sat	Saturday	SFO	Simulated Flameout
satfy	satisfactory	SG	Senegal
SAVASI	Simplified Abbreviated Visual Approach Slope Indicator	sgl	signal
SAWRS	Supplemental Aviation Weather Reporting Station	SH	St. Helena
SBA	Standard Beam Approach	SHAPE	Supreme Headquarters Allied Powers Europe
Sbnd	Southbound	SHF	Super High Frequency (3000 to 30000 MHz)
sby	standby	SI	Slovenia
SC	St. Kitts and Nevis	SIAP	Standard Instrument Approach Procedure
SCATANA	Security Control of Air Traffic and Air Navigational Aids	SID	Standard Instrument Departure
Sched	scheduled services	SIF	Selective Identification Feature
SCT	Scattered	simul	simultaneously
sctr	sector	SIZ	Security Identification Zone
S/D	Seadrome	sked	schedule
SDF	Simplified Directional Facility	SL	Sierra Leone
SE	Seychelles	SM	statute miles
SE	Southeast	SMC	surface movement control
sec	second, section	SMR	surface movement radar
secd	secondary	SN	Singapore
seg	segment	SO	Somalia
		SOAP	Spectrometric Oil Analysis Program

FLIP AND NOTAM ABBREVIATIONS F-25

SOF	Supervisor of Flying	SV	Svalbard
SP	Spain	svc	service
SR	Short Range	svcbl	serviceable
SR	Slow Speed Low Altitude Training Route	svcg	servicing
SR	Sunrise	SVFR	Special Visual Flight Rules
SRE	Surveillance Radar Element of GCA (Instrument Approach Procedures Identification only)	SW	Southwest
		SW	Sweden
		swy	stopway
SRR	search and rescue region	sxn	section
SRS	Substitute Route Structure	SY	Syria
SS	Sunset	sys	system
SSALF	Simplified Short ALS with sequenced flashers	SZ	Switzerland
SSALS/R	Simplified Short Approach Lighting System/with RAIL	T	
SSB	Single Sideband		
SSR	Secondary Surveillance Radar	T	Ground Transmit
		T	Terminal Area Chart (followed by identification)
		T	True (after a bearing)
SST	Supersonic Transport	TA	Transition Altitude
ST	St. Lucia	TA	Transition Area (for chart use only)
STAR	Standard Terminal Arrival		
std	standard	TAC	TACAN (For Instrument Approach Procedures Only)
stn	station	TACAN	Tactical Air Navigation Equipment
STOL	Short Take-Off and Landing		
stor	storage	TAF	Aerodrome (terminal or alternate) forecast in abbreviated form
str-in	Straight-in		
stu	student	TAFOR	Aerodrome (terminal or alternate) forecast in full form
SU	Sudan		
subj	subject	TAFOT	Aerodrome Forecast in Units of English System
sum	summer		
Sun	Sunday	TALCE	Tanker Airlift Control Element
sur	surround	TAMET	Aerodrome Forecast in Units of Metric System
survl	survival, surveillance		
suspd	suspended	TAR	Terminal Area Surveillance Radar (for NOTAM use only)

F-26 FLIP AND NOTAM ABBREVIATIONS

TAS	True Airspeed	TK	Turks and Caicos I
TBA	to be activated	tkof	takeoff
TBI	to be inactivated	T-LA	Terminal Low Altitude (FLIP)
TCA	Terminal Control Area	TLa	Transition Layer
TCH	Threshold Crossing Height	TLv	Transition Level
TCN	Terminal Change Notice	tmpry	temporary
TCTA	Transcontinental Control Area	TN	Tonga
TD	Touchdown	TO	Togo
TD	Transponder	TOC	tactical operations center
TD	Trinidad and Tobago	TODA	Take-off Distance Available
TDWR	Terminal Doppler Weather Data	TORA	Take-off Run Available
TDZ	Touchdown Zone	TP	Sao Tome and Principe
TDZE	Touchdown Zone Elevation (For Instrument Approach Procedures Only)	TP	Tire Pressure
TDZL	Touchdown Zone Lights	TPC	Tactical Pilotage Chart
TE	Tromelin Island	tr	track
temp	temperature	TRA	Temporary Reserved Airspace
TF	Terrain Following	TRACON	Terminal Radar Approach Control (FAA)
tfc	traffic	tran	transient
TFR	Terrain Following Radar	trans	transmit
TGL	touch and go landing	trml	terminal
TGS	taxiway guidance system	trng	training
TH	Thailand	trns	transition
T-HA	Terminal High Altitude (FLIP)	TRSA	Terminal Radar Service Area
thld	threshold	T-S	Terminal Seaplane (FLIP)
thou	thousand	TS	Tunisia
THRE	Threshold elevation	TSA	Temporary Segregated Airspace
thru	through	TT	East Timor
Thu	Thursday	TT	teletype
TI	Tajikistan	TU	Turkey
til	until	Tue	Tuesday
		turb	turbulence

FLIP AND NOTAM ABBREVIATIONS F-27

TV	Television	unavbl	unavailable
TV	Tuvalu	unctl	uncontrolled
TW	Taiwan	unk	unknown
twd	toward	unlcig	unlimited ceiling
TWEB	Transcribed Weather Broadcast	unlgt	unlighted
twr	tower	unltd	unlimited
TWX	Telegraphic Message	unmrk	unmarked
twy	taxiway	unmto	unmonitored
twyl	taxiway link	unrel	unreliable
TX	Turkmenistan	unrstd	unrestricted
TZ	United Republic of Tanzania	unsatfy	unsatisfactory
U		unsked	unscheduled
		unsvc	unserviceable
U	Upper (spoken ICAO ATS route designator)	unuse	unusable
UAB	until advised by	UP	Ukraine
UACC	Upper Area Control Center (used outside US)	US	United States
UAR	Upper Air Route	USA	United States Army, United States of America
UC	under construction (for chart use only)	USAF	United States Air Force
UCN	Urgent Change Notice	USAFE	United States Air Force in Europe
UDA	Upper Advisory Area	USAFIB	US Army Flight Information Bulletin
UDF	Ultra High Frequency Direction Finder	USAP	US Antarctic Program
UFA	until further advised	USB	Upper Side Band
UFN	until further notice	USBER	US Mission Berlin
UG	Uganda	USCG	United States Coast Guard
UHF	Ultra High Frequency (300 to 3000 MHz)	USMC	United States Marine Corps
		USMTM	US Military Training Mission
UIC	Upper Information Center	USN	United States Navy
UIR	Upper Flight Information Region	USNOF	US NOTAM Facility
UK	United Kingdom	UTA	Upper Control Area
unauthd	unauthorized	UTC	Coordinated Universal Time

F-28 FLIP AND NOTAM ABBREVIATIONS

UTRACC	USAFE Tanker Recce Airlift Control Center	vis	visibility
UV	Burkina Faso	VLF	Very Low Frequency
UY	Uruguay	VM	Vietnam
UZ	Uzbekistan	VMC	Visual Meteorological Conditions
V		VNAV	Vertical Navigation
V	Defense Switch Network (telephone formerly AUTOVON)	VOLMET	Meteorological Information for Aircraft in Flight
V	VOR Federal Airway (followed by identification)	VOR	VHF Omnirange
VAL	Visiting Aircraft Line	VORTAC	VOR and TACAN Navigational Facilities - collocated
var	magnetic variation	VOT	VOR receiver testing facility
VASI	Visual Approach Slope Indicator	VQ	Virgin I (US)
VC	St. Vincent and the Grenadines	VR	VFR Military Training Route
VCIA	Vehicle Component Impact Area	vrb	variable
vcnty	vicinity	vsp	vertical speed
VDA	Vertical Descent Angle	V/STOL	Vertical and Short Take-Off and Landing aircraft
VDF	Very High Frequency Direction Finder	VTOL	vertical takeoff and landing
VDP	visual descent point	V/V	Vertical Velocity
VE	Venezuela	W	
veh	vehicle	W	Warning Area (followed by identification)
vert	vertical	W	Watts, West, White
VFC	Visual Flight Conditions	WA	Namibia
VFR	Visual Flight Rules	WAAS	Wide Area Augmentation System
VFR-S	FLIP VFR Supplement	WAC	World Aeronautical Chart
VGSI	Visual Glide Slope Indicating System	wbar	with bar lights
VHF	Very High Frequency (30 to 300 MHz)	Wbnd	Westbound
VI	Virgin I (UK)	WDI	wind direction indicator
via	by way of	wspr	widespread
VIP	Very Important Person	Wed	Wednesday
		WEF	With Effect From

FLIP AND NOTAM ABBREVIATIONS F-29

WEF	Effective From	W/T	Wireless Telegraphy
WEPS	Weapons	wx	weather
WF	Wallis I and Futuna	WxR	Weather Radar
Wg	Wing	WZ	Swaziland
WGS	World Geodetic System		X
WI	Western Sahara	x	cross
wi	within	xbar	crossbar
wid	width		Y
WIE	with immediate effect		
win	winter	Y	Yellow
WIP	work in progress	YCZ	yellow caution zone
wk	week	yd	yard
wkd	weekday	YG	Yellow-Green Beacon
wkend	weekend	YI	Serbia and Montenegro
wkly	weekly	YM	Yemen
wng	warning	yr	year
wo	without		Z
WPM	Words per minute	Z	Greenwich Mean Time (time groups only)
WPT	waypoint (RNAV)	Z	VHF Station Location Marker
WQ	Wake I	ZA	Zambia
WS	Western Samoa	ZI	Zimbabwe
WSP	Weather System Processor	ZI	Zone of Interior
wt	weight		

F-30 FLIP AND NOTAM ABBREVIATIONS

2. NOTAM CODE -

(ICA DOC 8400)

a. The ICAO NOTAM Code is published to enable the coding of information regarding the establishment, condition or change of radio aids, aerodromes and lighting facilities, dangers to aircraft in flight, or search and rescue facilities. Encoding facilitates the dissemination of NOTAMs by reducing the transmission time over telecommunication channels and eliminating translation. The transmission of NOTAM over the international aeronautical telecommunication service is governed by the appropriate sections of the current "Communication Procedures" and Aeronautical Information Services Procedures. The former contains information on the acceptability of and priority to be accorded to NOTAM for transmission over the international aeronautical telecommunication service, the latter has full instructions on the textual format and contents of NOTAM.

b. All NOTAM Code groups contain a total of five letters:

(1) The first letter of the Code group is always the letter Q to indicate that it is a Code abbreviation for use in the composition of NOTAM. The letter Q has been chosen to avoid conflict with any assigned radio call sign.

(2) The second and third letters identify the subject reported upon and

(3) The fourth and fifth letters denote its status of operation. The code identifying the subject or denoting its status of operation is, whenever possible, self-evident. Where more than one subject could be identified by the same self-evident code the most important subject is chosen.

(a) Facilities, services and other information which require coding have been classified by subject into sections and subsections. The second letter of the code group, which may be any letter of the alphabet except Q, indicates the subject subsections as follows:

AGA (Aerodromes)

L IGHTING facilities	- L
M OVEMENT and landing area	- M
F ACILITIES and services	- F

COM (Communications)

C OMMUNICATION and radar facilities	- C
I NSTRUMENT and microwave landing systems	- I
terminal and enroute N AVIGATION facilities	- N

RAC (Rules of the Air and Air Traffic Services)

A IRSPACE organization	- A
air traffic and VOLMET S ERVICES	- S
air traffic P ROCEDURES	- P

Military - **G**

Navigation Warnings

airspace R ESTRICTIONS	- R
W ARNINGS	- W

Other information

O THER information	- O
---------------------------	------------

FLIP AND NOTAM ABBREVIATIONS F-31

(b) The fourth letter of the code group, which may be any letter of the alphabet except Q, indicates status subsections as follows:

A	A ailability
C	C hanges
H	H azard conditions
L	L imitations
G	M ilitary
XX	O ther

c. The significations assigned to NOTAM Code groups are to be amplified or completed where necessary by the addition of appropriate location indicators, name of station, geographical coordinates, abbreviations, frequencies, call signs or figures. ICAO abbreviations are to be used in preference to plain language wherever possible. The information necessary to complete a signification, as indicated between parentheses, shall be given as applicable. For amplification of the NOTAM Code as necessary to complete a signification the following applies:

(1) amplifications relating to the second and third letters (subject of the NOTAM) must precede the NOTAM Code.

(2) amplifications relating to the fourth and fifth letters (status of operation) must follow the NOTAM Code.

Examples (as applicable to Item E) of the NOTAM Class I format:

(a) The touchdown zone lights of RWY 27 are not available due to power failure.

Coded version:

E) RWY 27 QLZAU DUE POWER FAILURE.

(b) The taxiway edge lights of TWY B are obscured by snow.

Coded version:

E) TWY B QLYHO.

(c) On the strip of RWY 09/27 snow banks to a height of 15 ft exist.

Coded version:

E) RWY 09/27 QMWHY 15 FT

(d) The minimum safe altitude in sector 90° to 180° inbound VOR ident DOM changed to 3600 ft AMSL.

Coded version:

E) MSA 90 TO 180 DEG INBOUND VOR DOM QAACH 3600 FT AMSL

d. Five (5) letter NOTAM Code groups are formed in the following manner:

(1) FIRST LETTER

(a) The letter Q (See paragraph b.)

(2) SECOND AND THIRD LETTERS

(a) The appropriate combination of two letters selected from the "Second and Third Letters" section of the Code to identify the facility, service or danger to aircraft in flight being reported upon. (See paragraph b. (3) (a)).

(3) FOURTH AND FIFTH LETTERS

(a) The appropriate combination of two letters selected from the "Fourth and Fifth Letters" section of the Code to denote the status of operation of the facility, service or danger to aircraft in flight reported upon. (See paragraph b. (3) (b)).

F-32 FLIP AND NOTAM ABBREVIATIONS

e. The NOTAM Code is to be used in conjunction with the NOTAM Class I format. The subject matter of the NOTAM will be subdivided into items identified by the letters A through G inclusive, each followed by a closing parenthesis. If there is no information for entry against a particular item, that item/identifier is omitted. The content of each item is:

ITEM	CONTENT
A)	ICAO location identifier of the aerodrome or FIR in which the facility, airspace, or condition being reported on is located. More than one FIR/UIR may be indicated when appropriate.
B)	Date/time group consisting of 8 figures, indicating the beginning of the period of validity giving month, day and hour in UTC or with immediate effect (WIE).
C)	Approximate duration (APRX DUR) of the period of validity, or permanent (PERM), or until further notice (UFN), or date/time group giving month, day and hour in UTC.
D)	Specified periods (if applicable) of activity of hazard, status or condition being reported on, within the period of validity.
E)	Text of the NOTAM coded, amplified or completed as necessary. Plain language will be used when suitable NOTAM Code groups are not available. ICAO abbreviations will be used when appropriate.
F)	Lower limit of Navigation Warnings/Airspace Reservations if applicable.
G)	Upper limit applicable to Item F).

NOTE: The use of this NOTAM format requires that each NOTAM deals with one subject and one condition concerning this subject only.

f. Examples of NOTAM Class I:

(1) The Distance Measuring Equipment (DME) at Paris/Orly not available on the 31st day of March at 2359 UTC until the 1st day of April at 0600 UTC.

NOTAM Class I:

A) LFPO B) 03312359 C) 04010600 E) QNDAU

Explanation:

Item A) ICAO location indicator identifying Paris/Orly, the location of the facility being reported on.

Item B) Date/time group of the beginning of the period of validity in which the facility is not available.

Item C) Date/time group of the end of the period of validity in which the facility is not available.

Item E) The letter "Q" identifies the five letter Code group as the NOTAM Code group. Second and third letter "ND" identifying "Distance measuring equipment (DME)". Fourth and fifth letter "AU" denoting that the facility is not available.

(2) In the Montreal FIR gun firing will take place on the 21st day of February from 0800 hours UTC until 1100 hours UTC within an area of 10 nautical miles radius around the location 45°37' North, 74°00' West from the surface up to an altitude of 6,100 metres (20,000 feet).

FLIP AND NOTAM ABBREVIATIONS F-33

NOTAM Class I:

A) CZUL B) 02210800 C) 02211100
 E) QWMLW RADIUS 10 NM AROUND 453700N 740000W
 F) SFC G) 6100 M (20000 FT)

3. THE NOTAM CODE - DECODE

SECOND AND THIRD LETTERS

Code Signification

AGA Lighting facilities (L)

LA Approach lighting system
 (specify runway and type)

LB Aerodrome beacon

LC Runway center line lights
 (specify runway)

LD Landing direction indicator
 lights

LE Runway edge lights (specify
 runway)

LF Sequenced flashing lights
 (specify runway)

LH High intensity runway lights
 (specify runway)

LI Runway end identifier lights
 (specify runway)

LJ Runway alignment indicator
 lights (specify runway)

LK Category II components of
 approach lighting system
 (specify runway)

LL Low intensity runway lights
 (specify runway)

LM Medium intensity runway
 lights (specify runway)

LP Precision Approach Path
 Indicator (PAPI) (specify
 runway)

LR All landing area lighting
 facilities

LS Stopway lights (specify
 runway)

LT Threshold lights (specify
 runway)

LV Visual Approach Slope
 Indicator system (VASI)
 (specify type and runway)

LW Heliport lighting

LX Taxiway center line lights
 (specify taxiway)

LY Taxiway edge lights (specify
 taxiway)

LZ Runway touchdown zone
 lights (specify runway)

**AGA
Movement and landing area (M)**

MA Movement area

MB Bearing strength (specify
 part of landing area or
 movement area)

MC Clearway (specify runway)

MD Declared distances (specify
 runway)

MG Taxiing guidance system

MH Runway arresting gear
 (specify runway)

MK Parking area

MM Daylight markings (specify
 threshold, center line, etc.)

MN Apron

MP Aircraft stands (specify)

MR Runway (specify runway)

MS Stopway (specify runway)

MT Threshold (specify runway)

MU Runway turning bay (specify
 runway)

MW Strip (specify runway)

MX Taxiway(s) (specify)

F-34 FLIP AND NOTAM ABBREVIATIONS

AGA Facilities and services (F)		CR	Surveillance radar element of precision approach radar system (specify wavelength)
FA	Aerodrome		
FB	Braking action measurement equipment (specify type)	CS	Secondary Surveillance Radar (SSR)
FC	Ceiling measurement equipment	CT	Terminal Area Surveillance Radar (TAR)
FD	Docking system (specify AGNIS, BOLDs, etc.)	COM Instrument and microwave landing systems (I)	
FF	Fire fighting and rescue	IC	Instrument Landing System (ILS)
FG	Ground movement control	ID	DME associated with ILS
FH	Helicopter alighting area/ platform	IG	Glide path (ILS) (specify runway)
FL	Landing direction indicator	II	Inner marker (ILS) (specify runway)
FM	Meteorological service (specify type)	IL	Localizer (ILS) (specify runway)
FO	Fog dispersal system	IM	Middle marker (ILS) (specify runway)
FP	Heliport	IO	Outer marker (ILS) (specify runway)
FS	Snow removal equipment	IS	ILS Category I (specify runway)
FT	Transmissometer (specify runway and, where applicable, designator(s) of transmissometer(s))	IT	ILS Category II (specify runway)
FU	Fuel availability	IU	ILS Category III (specify runway)
FW	Wind direction indicator	IW	Microwave Landing System (MLS) (specify runway)
FZ	Customs	IX	Locator, outer (ILS) (specify runway)
COM Communications and radar facilities (C)		IY	Locator, middle (ILS) (specify runway)
CA	Air/ground facility (specify service and frequency)	COM Terminal and enroute navigation facilities (N)	
CE	Enroute surveillance radar	NA	All radio navigation facilities (except . . .)
CG	Ground Controlled Approach system (GCA)	NB	Non-directional radio beacon
CL	Selective Calling system (SELCAL)	NC	DECCA
CM	Surface movement radar		
CP	Precision Approach Radar(PAR) (specify runway)		

FLIP AND NOTAM ABBREVIATIONS F-35

ND	Distance Measuring Equipment (DME)	RAC Airspace organization (A)	
NF	Fan marker	AA	Minimum altitude (specify enroute/crossing/safe)
NL	Locator (specify identification)	AC	Class C airspace (CTR)
NM	VOR/DME	AD	Air Defense Identification Zone (ADIZ)
NN	TACAN	AE	Control Area (CTA)
NT	VORTAC	AF	Flight Information Region (FIR)
NV	VOR	AG	General Facility
NX	Direction finding station (specify type and frequency)	AH	Upper control area (UTA)
Military (G)	(AFJM 11-208)	AL	Minimum usable flight level
		AN	Area navigation route
GA	Plasi (PVGSI)	AO	Oceanic Control Area (OCA)
GB	OLS	AP	Reporting point (specify name or coded designator)
GC	Trans maint	AR	ATS route (specify)
GD	Starter unit	AT	Class B airspace (TMA)
GE	SOAP	AU	Upper flight information region (UIR)
GF	Demineralized water	AV	Upper advisory area (UDA)
GG	Oxygen	AX	Intersection (INT)
GH	Oil	AZ	Class D airspace (ATZ)
GI	Drag chutes	RAC Air traffic and VOLMET services (S)	
GJ	ASR	SA	Automatic Terminal Information Service (ATIS)
GK	ACLS	SB	ATS reporting office
GL	FACSFAC	SC	Area Control Center (ACC)
GM	LOC	SE	Flight Information Service (FIS)
GN	Chart chg	SF	Aerodrome Flight Information Service (AFIS)
GO	Warning area	SL	Flow control center
GP	MOA	SO	Oceanic Area Control Center (OAC)
GS	Nitrogen		
GU	De-ice		
GW	Ref E-S No-NOTAM preventive maint sked		
GX	Urgent change notice		

F-36 FLIP AND NOTAM ABBREVIATIONS

SP	Approach control service (APP)
SS	Flight Service Station (FSS)
ST	Aerodrome control tower (TWR)
SU	Upper area control center (UAC)
SV	VOLMET broadcast
SY	Upper advisory service (specify)
TT	MIJI

RAC
Air traffic procedures (P)

PA	Standard instrument arrival (STAR) (specify route designator)
PD	Standard Instrument Departure (SID) (specify route designator)
PF	Flow control procedure
PH	Holding procedure
PI	Instrument approach procedure (specify type and runway)
PL	Obstacle clearance limit (specify procedure)
PM	Aerodrome operating minima (specify procedure and amended minimum)
PO	Obstacle clearance altitude
PP	Obstacle clearance height
PR	Radio failure procedure
PT	Transition altitude
PU	Missed approach procedure (specify runway)
PX	Minimum holding altitude (specify fix)
PZ	ADIZ procedure

Navigation Warnings
Airspace restrictions (R)

RA	Airspace reservation (specify)
RD	Danger area (specify national prefix and number)
RO	Overflying of . . . (specify)
RP	Prohibited area (specify national prefix and number)
RR	Restricted area (specify national prefix and number)
RT	Temporary restricted area

Navigation Warnings
Warnings (W)

WA	Air display
WB	Aerobatics
WC	Captive balloon or kite
WD	Demolition of explosives
WE	Exercises (specify)
WF	Air refueling
WG	Glider flying
WJ	Banner/target towing
WL	Ascent of free balloon
WM	Missile, gun or rocket firing
WP	Parachute Jumping Exercise (PJE)
WS	Burning or blowing gas
WT	Mass movement of aircraft
WV	Formation flight
WZ	Model flying

Other Information (O)

OA	Aeronautical information service
OB	Obstacle (specify details)
OE	Aircraft entry requirements
OL	Obstacle lights on . . . (specify)

FLIP AND NOTAM ABBREVIATIONS F-37

OR	Rescue coordination center	CI	Identification or radio call sign changed to
XX	Unknown		

FOURTH AND FIFTH LETTERS

Code Signification

Availability (A)

AC	Withdrawn for maintenance
AD	Available for daylight operation
AF	Flight checked and found reliable
AG	Operating but ground checked only, awaiting flight check
AH	Hours of service are now
AK	Resumed normal operation
AM	Military operations only
AN	Available for night operation
AO	Operational
AP	Available, prior permission required
AR	Available on request
AS	Unserviceable
AU	Not available (specify reason if appropriate)
AW	Completely withdrawn
AX	Previously promulgated shutdown has been canceled

Changes (C)

CA	Activated
CC	Completed
CD	Deactivated
CE	Erected
CF	Frequency changed to
CG	Downgraded to
CH	Changed

CL	Realigned
CM	Displaced
CO	Operating
CP	Operating on reduced power
CR	Temporarily replaced by
CS	Installed
CT	On test, do not use

Hazard Conditions (H)

HA	Braking action is . . . 1) Poor 2) Medium/Poor 3) Medium 4) Medium/Good 5) Good
HB	Braking coefficient is . . . (specify measurement device used)
HC	Covered by compacted snow to a depth of
HD	Covered by dry snow to a depth of
HE	Covered by water to a depth of
HF	Totally free of snow and ice
HG	Grass cutting in progress
HH	Hazard due to (specify)
HI	Covered by ice
HJ	Launch planned . . . (specify balloon flight identification or project code name, launch site, planned period of launch(es) - date/time, expected climb direction, estimate time to pass 18,000 m (60,000 ft), or reaching cruising level if at or below 18,000 m (60,000 ft), together with estimated location)
HK	Migration in progress
HL	Snow clearance completed

F-38 FLIP AND NOTAM ABBREVIATIONS

HM	Marked by	LG	Operating without identification
HN	Covered by wet snow or slush to a depth of	LH	Unserviceable for aircraft heavier than
HO	Obscured by snow	LI	Closed for IFR operations
HP	Snow clearance in progress	LK	Operating as a fixed light
HQ	Operations Cancelled	LL	Usable for length of . . . and width of . . .
HR	Standing water	LN	Closed to all night operations
HS	Sanding	LP	Prohibited to
HT	Approach according to signal area only	LR	Aircraft restricted to runways and taxiways
HU	Launch in progress . . . (specify balloon flight identification or project code name, launch site, date/time of launch(es), estimated time passing 18,000 m (60,000 ft), or reaching cruising level if at or below 18,000 m (60,000 ft), together with estimated location, estimated date/time of termination of the flight and planned location of ground contact, when applicable)	LS	Subject to interruption
		LT	Limited to
		LV	Closed to VFR operations
		LW	Will take place
		LX	Operating but caution advised due to
		LY	Effective
HV	Work completed	TT	Hazard
HW	Work in progress		
HX	Concentration of birds		
HY	Snow banks exist (specify height)	MILITARY (G)	
		GA	Not coincidental with ILS/ PAR
		GB	In raised position
HZ	Covered by frozen ruts and ridges	GC	Tail hook only
		GD	Official business only
Limitation (L)		GE	Except landing delay
LA	Operating on auxiliary power supply	GF	Extensive service delay
LB	Reserved for aircraft based therein	GG	Unusable beyond
LC	Closed	GH	Unusable
LD	Unsafe	GI	Unmonitored
LE	Operating without auxiliary power supply	GV	Not authorized
		OTHERS	(XX)
LF	Interference from	XX	Unknown

FLIP AND NOTAM ABBREVIATIONS F-39

4. NATIONAL FLIGHT DATA CENTER (NFDC) FDC NOTAM CONTRACTIONS -

This listing contains contractions used by the FAA's NFDC in FDC NOTAMs. These contractions will not be used in the DoD FLIP or NOTAM Systems. These contractions appear in the FAA Notices to Airmen Book.

A		CD	Clearance Delivery
AADC	Approach and Departure Control	CDAS	Class D Airspace
A/C	Approach Control	CDSA	Class D Surface Area
ACCUM	Accumulate	CEAS	Class E Airspace
ACR	Air Carrier	CESA	Class E Surface Area
ACT	Restricted Area	CFA	Controlled Firing Area
ACTV/ACTVT	Active/Activate	CGAS	Class G Airspace
ADZ/ADZA	Advise/Advised	CLKWS	Clockwise
AFD	Airport Facility Directory	CMSN/ CMSND	Commission/ Commissioned
AFSS	Automated Flight Service Station	CNCL/ CNCLD/CNL	Cancel/Canceled/Cancel
ALTM	Altimeter	CNTRLN	Centerline
ALSTG	Altimeter Setting	D	
AP	Airport	DALGT	Daylight
APL	Airport Lights	DCMS/ DCMSND	Decommission/ Decommissioned
AP LGT	Airport Lighting	DISABLD	Disabled
ARFF	Aircraft Rescue & Fire Fighting	DLA/DLAD	Delay/Delayed
ATCT	Airport Traffic Control Tower	DMNST	Demonstration
AZM	Azimuth	DPCR	Departure Procedure
B		DRFT/DRFTD	Drift/Drifted Snowbanks (Caused by wind action)
BERM	Snowbank(s) Containing Earth/Gravel	DSTC	Distance
BLO	Below	DWPNT	Dew Point
BND	Bound	E	
C		EFAS	Enroute Flight Advisory Service
CAAS	Class A Airspace	ENTR	Entire
CBAS	Class B Airspace	EXCP	Except
CBSA	Class B Surface Area	F	
CCAS	Class C Airspace	FA	Final Approach
CCSA	Class C Surface Area		

F-40 FLIP AND NOTAM ABBREVIATIONS

FRH	Fly Runway Heading	PAJA	Parachute Jumping Activities
FRZN	Frozen	PCL	Pilot Controlled Lighting
G		PLW	Plow/Plowed
GP	Glide Slope	PRIRA	Primary Radar
H		PROP	Propeller
HEL	Helicopter	PSGR	Passenger
HELI	Heliport	PT/PTN	Procedure Turn
HP	Holding Pattern	R	
I		REP	Report
IBND	Inbound	RMDR	Remainder
ID	Identification	RQRD	Required
L		RSVN	Reservation
LAA	Local Airport Advisory	RT	Right Turn After Take-off
LAWRS	Limited Aviation Weather Reporting Station	RTS	Return to Service
LC	Local Control	RVRM	RVR Midpoint
LNDG	Landing	RVRR	RVR Rollout
LO	Compass Locator	RVTR	RVR Touchdown
LRN	Loran	RVV	Runway Visibility Value
LT		S	
Left Turn After Take-off		SECRA	Secondary Radar
M		SI	Straight-In Approach
MMM	Minimum	SND	Sand/Sanded
MONTR	Monitor	SNGL	Single
MSAW	Minimum Safe Altitude Warning	SNW	Snow
N		T	
NMR	Nautical Mile Radius	TDWR	Terminal Doppler Wx Radar
O		TEMPO	Temporary
OBSTN	Obstruction	TFR	Temporary Flight Restrictions
OPER	Operate	TNH	Thin
OVR	Over	THR	Threshold
P		TRSN	Transition
PAEW	Personnel and Equipment Working	TSNT	Transient

FLIP AND NOTAM ABBREVIATIONS F-41

U

UNMKD	Unmarked
UNMNT	Unmonitored
UNRELBL	Unreliable
UNUSBL	Unuseable

W

WKDAYS	Weekdays (Mon-Fri)
WND	Wind
WP	Waypoint
WTR	Water on Runway(s)

V

VICE	Instead of/Versus
------	-------------------

**INTENTIONALLY
LEFT
BLANK**

SIGNALS INITIATED BY INTERCEPTED AIRCRAFT AND RESPONSES BY INTERCEPTING AIRCRAFT

SERIES	INTERCEPTED AIRCRAFT SIGNALS	MEANING	INTERCEPTING AIRCRAFT RESPONSE	MEANING
4	DAY or NIGHT - Raising landing gear (if fitted) and flashing landing lights while passing over runway in use or helicopter landing area at a height exceeding 300 m (1000 ft) but not exceeding 600 m (2000 ft) (in the case of a helicopter, at a height exceeding 50 m (170 ft) but not exceeding 100 m (330 ft) above the airport level, and continuing to circle runway in use or helicopter landing area. If unable to flash landing lights, flash any other lights available.	Airport You have designated is inadequate.	DAY or NIGHT - If it is desired that the intercepted aircraft follow the intercepting aircraft to an alternate airport, the intercepting aircraft raises its landing gear (if fitted) and uses the Series 1 signals prescribed for intercepting aircraft. If it is decided to release the intercepted aircraft, the intercepting aircraft uses the Series 2 signals prescribed for intercepting aircraft.	Understood follow me. Understood you may proceed.
5	DAY or NIGHT - Regular switching on and off of all available lights but in such a manner as to be distinct from flashing lights.	Cannot comply.	DAY or NIGHT - Use Series 2 signals prescribed for intercepting aircraft.	Understood
6	DAY or NIGHT - Irregular flashing of all available lights.	In distress.	DAY or NIGHT - Use Series 2 signals prescribed for intercepting aircraft.	Understood

ACTION BY INTERCEPTED AIRCRAFT

1. The word "interception" in this context does not include intercept and escort service provided, on request, to an aircraft in distress, in accordance with the Search and Rescue Manual (Doc 7333).
2. An aircraft which is intercepted by another aircraft shall immediately:
 - a. follow the instructions given by the intercepting aircraft, interpreting and responding to visual signals;
 - b. notify, if possible, the appropriate air traffic services unit;
 - c. attempt to establish radio communication with the appropriate intercept control unit, by making a general call on the emergency frequency 121.5 MHz, giving the identity of the intercepted aircraft and the nature of the flight; and if no contact has been established and if practicable, repeating this call on the emergency frequency 243 MHz;
 - d. if equipped with SSR transponder select Mode 3/A Code 7700, unless otherwise instructed by the appropriate air traffic services unit.
3. If any instructions received by radio from any sources conflict with those given by the intercepting aircraft by visual or radio signals, the intercepted aircraft shall request immediate clarification while continuing to comply with the instructions given by the intercepting aircraft.

**INTERCEPTION SIGNALS - ICAO STANDARD
FOR COUNTRY EXCEPTIONS TO ICAO STANDARD
SEE SECTION A**

(ICAO ANNEX 2, RULES OF THE AIR, NOV 91)

**SIGNALS INITIATED BY INTERCEPTING AIRCRAFT AND
RESPONSES BY INTERCEPTED AIRCRAFT**

SERIES	INTERCEPTING AIRCRAFT SIGNALS	MEANING	INTERCEPTED AIRCRAFT RESPONSE	MEANING
1	<p>DAY or NIGHT - Rocking aircraft and flashing navigational lights at irregular intervals (and landing lights in the case of a helicopter) from a position slightly above and ahead of, and normally to the left of, the intercepted aircraft (or to the right if the intercepted aircraft is a helicopter) and, after acknowledgment, a slow level turn, normally to the left, (or to the right in the case of a helicopter) on the desired heading.</p> <p>NOTE 1: Meteorological conditions or terrain may require the intercepting aircraft to reverse the positions and direction of turn given above in Series 1.</p> <p>NOTE 2: If the intercepted aircraft is not able to keep pace with the intercepting aircraft, the latter is expected to fly a series of race-track patterns and to rock the aircraft each time it passes the intercepted aircraft.</p>	<p>You have been intercepted. Follow me.</p>	<p>DAY or NIGHT - Rocking aircraft, flashing navigational lights at irregular intervals and following.</p> <p>NOTE: Additional action required to be taken by intercepted aircraft is prescribed in "ACTION BY INTERCEPTED AIRCRAFT."</p>	<p>Understood, will comply.</p>
2	<p>DAY or NIGHT - An abrupt breakaway maneuver from the intercepted aircraft consisting of a climbing turn of 90 degrees or more without crossing the line of flight of the intercepted aircraft.</p>	<p>You may proceed.</p>	<p>DAY or NIGHT - Rocking aircraft.</p>	<p>Understood, will comply.</p>
3	<p>DAY or NIGHT - Lowering landing gear (if fitted), showing steady landing lights and overflying runway in use or, if the intercepted aircraft is a helicopter, overflying the helicopter landing area. In the case of helicopters, the intercepting helicopter makes a landing approach, coming to hover near to the landing area.</p>	<p>Land at this airport.</p>	<p>DAY or NIGHT - Lowering landing gear, (if fitted), showing steady landing lights and following the intercepting aircraft and, if after overflying the runway in use or helicopter landing area, landing is considered safe, proceeding to land.</p>	<p>Understood will comply.</p>

CONTINUE TO INSIDE BACK COVER

FIH

22 JAN 2004 to 2 SEP 2004